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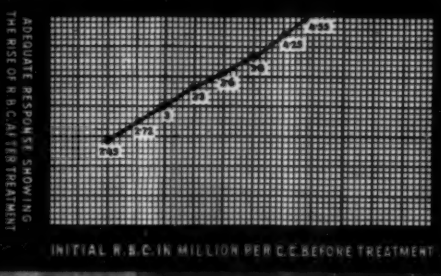

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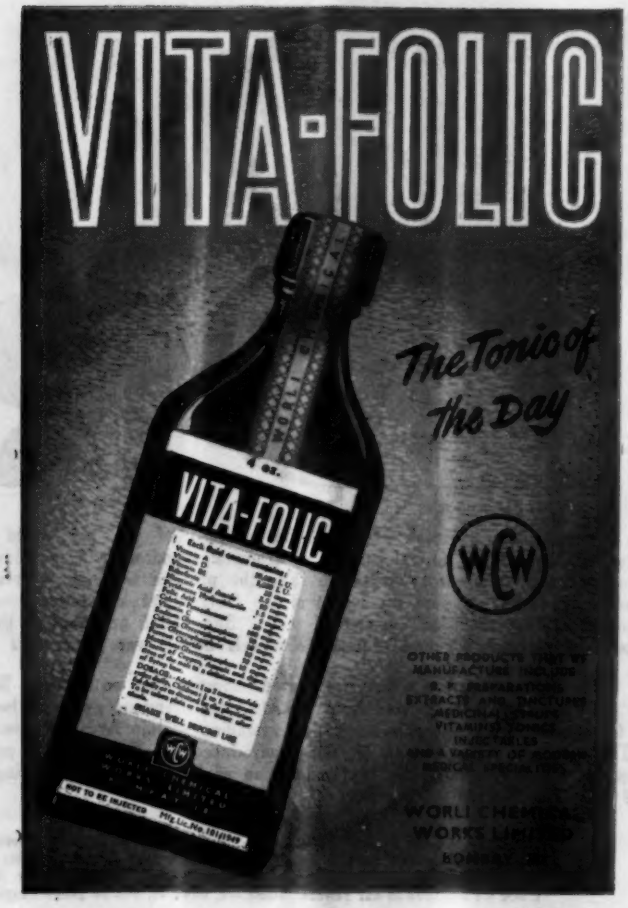

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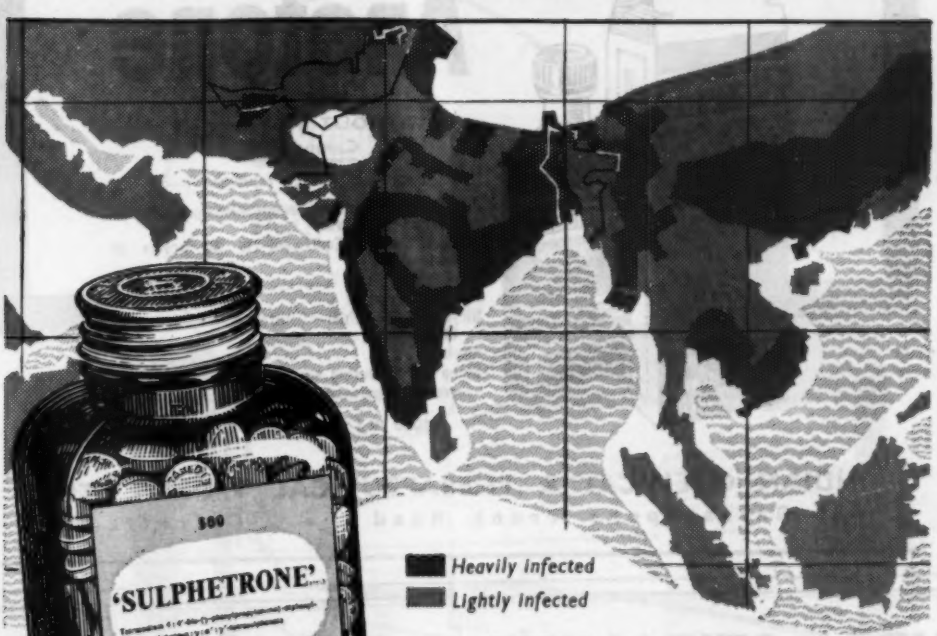

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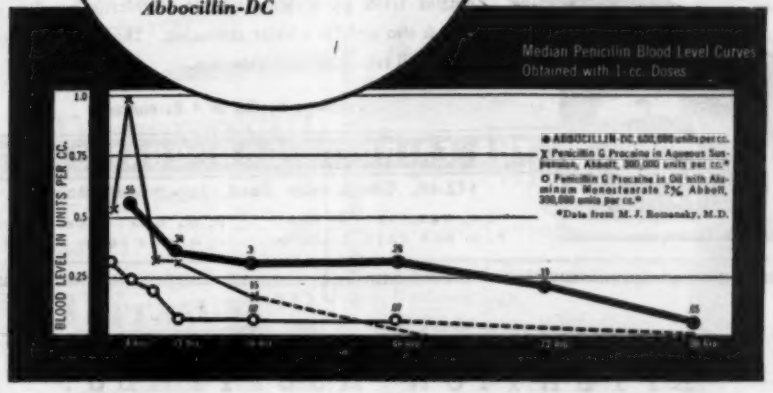
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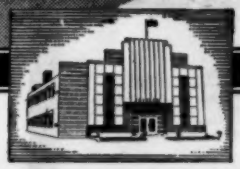

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ACUTE HEPATIC FAILURE IN INFECTIVE HEPATITIS WITH A REPORT OF SIX CASES

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It is now generaliy recognised that the common 'catarrhal jaundice' is not caused by an obstruction at the mouth of the common bile duct in the duodenum as was postulated by Virchow, but is caused by infection with a filterable virus which produces some definite pathological changes in the liver. Although the common 'catarrhal jaundice' or infective hepatitis is by itself a mild condition in most cases, its relation with the more severe types of hepatic jaundice of apparently unknown etiology has only been recently realised from studies on the occurrence of epidemics of infective hepatitis under war and famine conditions and from the study of experimental liver damage.

Infective hepatitis is generally a benign condition with almost negligible mortality (0·2% to 0·4%). But outbreaks with appreciably high mortality have been reported. Witts (1944), reported 4% mortality amongst Belgian colonial troops. During the last war, although the incidence of infective hepatitis was less amongst Indian troops compared with the British troops, the mortality was five times higher in the Indian troops (Witts, 1947). Banerji (1945) reported 258 cases of infective hepatitis among Indians in the army, with 2 deaths. Mortality figures of infective hepatitis in civilian population in India are not available. Patel (1946) reported an epidemic with 59 cases in which there was no deaths. Severe types of hepatitis are reported from time to time. Samad and Kapoor (1950) reported a case with coma, who eventually recovered. Tandon and Agarwalla (1945) reported a fatal case.

From the war-time studies there is a strong suggestion that malnutrition is an important predisposing factor in determining the seriousness of infective hepatitis and the analogous conditions of homologous serum jaundice and post-arsphenamine jaundice.

Infective hepatitis occurs fairly commonly in Calcutta almost throughout the year. Most cases are mild and do not come to the hospital. Many are treated at the out-patients' department.

Reports of acute yellow atrophy of the liver in India are meagre. Tribedi and Banerji (1941) described 6 cases from the postmortem records of 4,000 unselected autopsies done at the Calcutta Medical College Hospital. Greval and Gupta (1945) reported 3 cases.

Infective Hepatitis and Massive Hepatic Necrosis

Cockayne (1912) first suggested a relation between acute yellow atrophy of the liver and infective hepatitis. Subsequent studies have amply supported this suggestion. Snavely (1950) in a review of fatal hepatitis says, "It is now generally conceded that most, if not all cases of acute yellow atrophy of indeterminate origin are examples of extremely severe cases of infective hepatitis....."

Biopsy studies in infective hepatitis have shown that the pathological changes in the acute stages of infective hepatitis consist in central zonal necrosis of the liver lobules with cellular infiltration around the portal tracts. The zonal necrosis differs in degree in different cases. In most cases changes are mild and with clinical improvement rapid regeneration of the liver tissue occurs, completely restoring the lobular structure. In more severe cases the necrosis is more diffuse and pronounced and considerable leucocytic and histiocytic infiltration into the lobules occur. In the most serious cases massive necrosis supervenes and either ends fatally or results in post-necrotic nodular scarring.

The reason why a usually mild disease causing slight zonal necrosis in liver sometimes causes severe massive necrosis is believed to be due to a "conditioned deficiency" (Himsworth, 1947). Recent studies on the effect of nutritional deficiency on the liver have shown that absence of the sulphur-containing amino acids, cystine and methionine, in the diet produces sudden massive necrosis of the liver in experimental animals. Moreover, it has been shown that proteins, specially those containing the essential sulphur-containing amino acids, can prevent damage to the liver cells by such poisons as chloroform or arsenic or any other hepatotoxic substance. When there is a deficiency of these amino acids, there is an exaggeration of the necrosis produced by hepatotoxic agents. Himsworth (*loc. cit.*) explains this by circulatory changes in the liver in hepatitis.

The previous nutritional status of the patient is, therefore, very important in infective hepatitis. If this is unsatisfactory, then anorexia, vomiting etc., which are early symptoms of infective hepatitis, may further reduce the essential materials for liver tissue available in the blood to a dangerously low level.

Besides malnutrition other factors may also lead to such a "conditioned deficiency" and predispose to

a massive necrosis in infective hepatitis. These conditions are pregnancy, old age, other serious illnesses, wounds, burns, surgical operations etc.

Clinical Features

Most cases of infective hepatitis show two stages. A preicteric stage and a stage of icterus. The onset is usually sudden with fever, anorexia, nausea and vomiting. Fever is often accompanied by chills and may be remittent or intermittent. Muscular pains, headache and backache or epigastric pain are not uncommon. The liver is usualy palpable and may be tender. The spleen may be palpable. After about 5 to 7 days jaundice appears. The early symptoms usually disappear gradually and in 2 to 3 weeks the jaundice clears up. In some cases, the symptoms persist longer. In more severe cases signs of deficiency of parenchymal functions of the liver appear. The onset of acute hepatic failure is sudden, usually with cerebral symptoms. After the usual preicteric stage which does not differ materially from other milder cases, jaundice develops. After a variable period from the onset of jaundice, the patient becomes restless, incoherent and delirious and gradually passes into coma. The temperature may or may not be high, may be even subnormal. Muscular twitchings and convulsions may occur. Neck may be stiff and plantar reflex may be extensor. Pulse is rapid and of low volume and tension. Respiration is hurried. Hæmorrhages in the skin and from mucous membranes, hæmatemesis, melæna or other internal hæmorrhages are common. In the later stages pulmonary œdema develops. Most of the cases showing these acute symptoms of hepatic failure end fatally.

In some cases rapid development of œdema and ascites occurs due to hypoalbuminæmia.

A peculiar foul cadaveric smell around the patient, described as "fetor hepaticus" is often present.

Blood usually shows a leucopenia with relative lymphocytosis and monocytosis.

Hepatic Failure

The failure of excretory function of the liver resulting in jaundice is seen in most cases of infective hepatitis. Cases of infective hepatitis without jaundice are, however, occasionally seen in an epidemic. The jaundice is the result of obstruction to the small intralobular biliary canaliculi by the inflamed and swollen liver cells. In severe cases destruction of liver cells also contribute to the retention of bile pigments in the blood.

Various liver function tests have been employed in the study of the liver function in inefective hepatitis. Although impaired function has been found in most cases by one or more tests, none of them is entirely satisfactory in assessing the severity of functional impairment of the liver as a whole in view of the diverse character of the functions of the liver.

In acute hepatic failure although many of the symptoms and signs are not directly ascribable to any known function of the liver, there are evidences of extreme failure of certain functions. Failure of the glycogenic function of the liver leads to hypoglycæmia which is responsible for muscular twitching, convulsions, prostration and confused state. But the hepatic coma cannot always be explained by hypoglycæmia. In fact, no satisfactory explanation of hepatic coma has yet been established. It has been ascribed to accumulation of many so-called toxic products of incomplete protein metabolism. According to Greene (1941) hepatic coma is not due to the effect of an as yet undiscovered toxin or poison but rather due to the summation of effects of the failure of the manifold activities of the liver which makes continuation of life impossible.

The failure of the liver to synthetize urea from amino acids results in a drop in the excretion of urea in urine with increase in the proportion of amino acids in urine. In the blood there is a fall in urea concentration and rise in amino acids. Necrosis of the liver cells liberate amino acids like tyrosine and leucine. In the absence of sufficient functioning liver parenchyma these are also excreted in urine and their crystals can be recognised under the microscope in the centrifuged urinary deposits. Their presence gives valuable diagnostic evidence of massive hepatic necrosis.

The failure of the function of formation of blood proteins, specially albumin and fibrinogen is shown by low concentration of these substances in the plasma. The hypoalbuminæmia is responsible for the appearance of œdema and ascites in many subacute cases.

Hæmorrhages are due to prothrombin deficiency, as well as lowered fibrinogen content in the blood. The prothrombin coagulation time is prolonged.

Treatment

Treatment of acute and severe liver disease is very unsatisfactory. Once hepatic coma sets in, recovery is very unlikely. Large quantities of glucose have to be given to replace the loss of glycogenic function of the liver. Opinions differ as to whether this should be given in distilled water or in saline solution, and as to the total quantity of the fluids to be administered. Low blood chlorides in most of these cases, specially when there is considerable vomiting seem to justify a saline vehicle for the glucose. An estimation of blood chlorides will help in the decision. Great care must be taken to avoid overloading with fluid and salt.

In one of our cases the urine was very highly acid in reaction, requiring as much as 87 cc. of N/10 NaOH to neutralise 100 cc. of urine. So we thought it was advisable to add some alkalies in the transfusion fluid. The urinary acidity should be a guide to avoid alkalosis in these cases.

Intravenous administration of protein hydrolysate, cystine or methionine, albumin and whole plasma have been tried with no obviously demonstrable benefit. Some even believe that they cause more harm than good. In the acute stage of hepatic necrosis with high blood amino acids and heavy amino-aciduria, when the liver cells are unable to utilise the amino acids, further

administration of amino acids or protein hydrolysates appears to be of doubtful value.

Recently Latner (1950) suggested the use of tocopherol in these cases to render the liver cells less sensitive to cystine deficiency. He has further advocated administration of potassium chloride, along with glucose solution and the vitamins of B group, as the plasma potassium tends to fall after large amounts of intravenous glucose. This author described a regime of treatment along these lines which he had successfully used in a series of six patients with only one death.

Vitamin K is indicated to improve the prothrombin content of blood. Small intramuscular doses (2 to 4 mgm.) should be given. There are indications that large doses of vitamin K and niacin may actually do more harm than good.

Very recently Farquhar *et al* (1950) have reported striking results with the use of aureomycin in hepatic coma. Four cases of acute hepatic coma, two secondary to acute viral hepatitis and two to portal cirrhosis were treated with aureomycin. The cases of viral hepatitis recovered completely. The other two cases were also relieved of the acute hepatic coma but continued to show chronic liver diseases of which one case died subsequently.

Rest of the treatment is symptomatic. Most of the patients being restless and even boisterous, require sedatives. But there is great danger in these cases of precipitating grave and fatal coma due to uncertain toxic action of most of the commonly used sedatives in the absence of the detoxicating action of the liver. Potassium bromide and phenobarbitone in small doses are perhaps the safest sedatives in these cases.

Lately we came across six very severe cases who were brought to the hospital in a state of acute hepatic failure and all of them died within short time after admission.

Case Reports

Case 1.—M.A., H.M. 24, a porter in the dock and staying in a 'bustee' was admitted on 1st May, 1949 with deep jaundice, delirium and restlessness. He had fever 7 days back for which he was treated in the outdoor dispensary as malaria with mepacrine, 3 tablets a day for 4 days. Jaundice was noticed on the 4th day when mepacrine was discontinued. On the 7th day the patient became incoherent, semi-conscious and delirious and was brought to hospital.

On examination the patient was delirious and restless. Temperature 98°F. Pulse rate 84 and respiration 20 per minute. Deeply jaundiced. Pupils dilated and sluggish. Kernig's sign—negative. Nothing abnormal was detected in the heart and lungs. The liver and the spleen were not palpable. Tendon jerks—present. Babinski's sign—negative. Blood pressure—95/60.

The patient gradually became more comatose. Temperature rose to 99°F. Nasal feed had to be given. Pulmonary œdema developed and the patient died 58 hours after admission.

Treatment: Sedatives, alkalies, intravenous fluids with glucose, and penicillin.

Laboratory Findings: Blood — W.B.C. — 9,100 per cmm, neutrophils—80%, lymphocytes—16%, monocytes—2%, eosinophils—2%. No abnormal leucocytes. Malaria parasites—negative. van den Bergh test—immediate direct reaction. Icteric Index—200.

Urine—Acid. Sp. gr.—1020. Albumin—++. Sugar—nil. Bile Salts and pigments—present. Acetone—Trace. Microscopic examination of deposits showed hyaline casts, a few pus cells and red blood cells.

Post-mortem was done in a police morgue as the case was suspected to be one of mepacrine poisoning. The liver was found to be small in size and uniformly deep yellow in colour. No histological examination was done. A macroscopic diagnosis of massive hepatic necrosis was given.

Case 2.—S. J. M.M. 35, a porter at the jetty and residing in a 'bustee'. Attended the out-patients' department for fever with chill on 26th December, 1949 and was found to have palpable spleen and liver. He was treated with quinine mixture and diaphoretics. Attended out-patients' department on 28th, 29th and 30th December, 1949. Fever was intermittent and constipation was present. On 30th December, 1949 the patient was found to have jaundice and became unconscious in the evening when he was admitted in the hospital.

Past history nothing significant. Right inguinal hernia was operated 2 years ago. On admission his condition was as follows—

Deeply unconscious. Deeply jaundiced. P/R—88/18 per min. Temperature—96°F. Pupils—equal, reacting sluggishly; corneal reflex—absent. Neck rigidity—absent. Kernig's sign—negative. Tendon jerks in lower limbs—exaggerated. Abdominal and plantar reflexes—absent. Extremities—no obvious signs of paralysis. Heart—no abnormality detected. Lungs—breath sounds normal, no adventitious sounds. Liver and spleen—not palpable. B.P.—100/50 mm. of Hg. Lumbar puncture—4 c.c. of clear fluid under normal pressure drawn.

A blood slide for malarial parasites was negative.

Treatment—quinine gr. 10 intramuscular, coramine—2 c.c. intramuscular 6-hourly, glucose 25% 25 c.c. intravenously with 5 c.c. of 40% hexamine. Nasal feeds.

Next day patient was worse. Unconscious. Pulse, soft—120 per minute. BP. 75/50 mm. of Hg. Resp.—28 per minute. Temp.—99°F. Lung—rales at the bases. Frequent coffee ground vomits.

Blood count—WBC—12,500 per cmm., neutrophils—88%, lymphocytes—12%, no malaria parasites seen.

Urine—Deep colour. Albumin—preset, a trace. Sugar—nil. Acetone—nil. Bile pigments and salts—present. Microscopic examination of deposits showed a few pus cells. van den Bergh test—immediate direct. Icteric index—35.

Dark ground illumination of blood and urinary deposits for leptospira—negative.

Treatment—intravenous saline and glucose by drip, penicillin, calcium and vitamin K.

Patient expired—31 hours after admission.

No post-mortem could be done.

Case 3.—A.A., M.M. 35, store-keeper in a dredging ship. Had fever with vomiting for 2 days. On the second day he felt very weak and became drowsy and was brought to the hospital on 25th May, 1950. On admission his condition was as follows:—

Semi-conscious and restless, moderately jaundiced. P/R—104/20 per minute. Temperature 97°F. Tongue—moist and coated. No rigidity in neck. Kernig's sign—negative. Pupils—equal and sluggish. Tendon jerks—normal. Babinski's sign—negative. Extremities—no sign of paralysis. Heart—nothing abnormal detected. Lungs—breath sounds normal: no adventitious sounds. Liver—just palpable. Spleen—not palpable.

Blood: Total WBC—7,900. Neutrophils—82%, lymphocytes—18%, M.P.—nil. van den Bergh test—immediate direct.

Urine—Sp. gr. 1022. Dark colour. Albumin—nil. Sugar—nil. Acetone—nil. Bile salts and pigments—present. Microscopic examination of deposits showed a few granular and epithelial casts and crystals of tyrosine.

Treatment—quinine gr. 10 intramuscular, sedatives and intravenous glucose solution.

Next day the patient became more deeply unconscious. Vomited dark coloured fluid. Temperature went up to 102°F. Tendon jerks abolished. P/R—130/50 per minute. B.P.—120/80. Lungs—impaired resonance and diminished breath sound at right base.

Dark ground illumination of blood and urinary deposit for leptospira—negative. Blood culture was sterile.

Penicillin started. Patient expired 27 hours after admission. No post-mortem examination was possible.

Case 4—S.M., H.M. 20, a porter at the docks staying in a "bustee", had irregular fever for 4 or 5 days, with aches and pains all over the body and vomiting. He was attending the out-patients' department for 4 days and was being treated with quinine mixture. On 13th June, 1950 he was brought to the hospital because of marked prostration.

No relevant past history could be elicited. On examination he was found to have a well-developed and muscular body. He was conscious and was replying to questions but was talking incoherently at times. Temperature—97°F. P/R—80/20 per minute. Marked jaundice present. Pupils—equal and reacting to light. No neck rigidity. No rash or haemorrhages in the skin. Nothing abnormal was found in the heart and lungs. The liver and the spleen could not be felt, but tenderness was found in the liver area on deep palpation. Tendon reflexes and superficial reflexes were normal.

A few hours later he became very restless and boisterous. Did not respond to questions. Babinski's sign—positive both sides. The condition became gradually worse in spite of treatment with intravenous glucose and hexamine, alkalies and fluid by Ryle's tube and penicillin by injection.

Next morning he was deeply unconscious. P/R—106/40 per minute. B.P.—110/70. Diffuse rales in both lungs. Vomitted coffee-ground material. The patient expired 21 hours after admission.

Laboratory findings: Blood—WBC—10,800 per cmm., neutrophils—82%, lymphocytes.—18%. No malaria parasites. van den Bergh reaction—immediate direct. Icteric index—65. Prothrombin time—3 minutes. Sugar—25 mgm. per cent. Chlorides—330 mgm. per cent. Urea—25 mgm. per cent. N.P.N.—42 mgm. per cent. Cholesterol—166 mgm. perc ent. Total plasma proteins—6·47 mgm. per cent. Albumin—3·98 mgm. per cent and globulin (including fibrinogen) 2·49 mgm. per cent.

Urine—Obtained by catheter. Deep yellow. Acid (total titrable acidity 87 c.c. of N/10 NaOH per 100 c.c. of urine). Albumin—a trace. Sugar—nil. Acetone—nil. Bile salts and pigments—present. Microscopical examination of centrifuged deposits showed a few pus cells and red blood cells, hyaline and granular casts and crystals of ammonium urate and tyrosine.

Chemical analysis of urine showed: urea nitrogen—0·072 per cent (normal 0·3 to 1·2 per cent), ammonia nitrogen—0·126 per cent (normal 0·05 per cent), amino acid nitrogen—0·79 per cent (normal 0·027 to 0·067 per cent). Samples of blood and urine were sent to Calcutta School of Tropical Medicine for detection of leptospira by culture and guinea-pig inoculation. The report was negative.

Post mortem—Immediately after death a large bore aspiration needle was introduced into the liver through the lower intercostal spaces on the right side and a portion of liver tissue was aspirated. Section from this piece stained with hæmatoxylin and eosin showed a general necrosis of liver cells. Only a few recognisable liver cells were visible at the periphery of the hepatic lobules. The cells of the liver sinusoids stood out prominently and the sinuses were markedly congested and dilated. Cellular infiltration was seen markedly around portal tracts as well as in hepatic lobules. Cells were mostly large and small round cells, occasional plasma cells and a few neutrophils. The bile capillaries were prominent (Figs. 1 and 2, Plate I).

Case 5—J.M., M.M. 30, a porter in the docks, staying in a "bustee" in Kidderpore was admitted on 18th July 1950. He had epigastric pain for 7 days with nausea and vomiting; fever 5 days; and jaundice for 4 days. He had vomited dark-coloured material twice and had a tarry stool on the morning of 18th July 1950.

On admission he was found to have a well-built, well-nourished and muscular body. He was conscious. Tongue—coated. Temperature—102°F. P/R—120/30 per minute. B.P.—115/55. There was a peculiar foul smell around the patient somewhat resembling stale fish. There was deep jaundice. No glandular enlargement. Abdomen was tense and distended all over with some muscular rigidity in the upper part. The liver was palpable 2 fingers below costal arch.

PLATE I

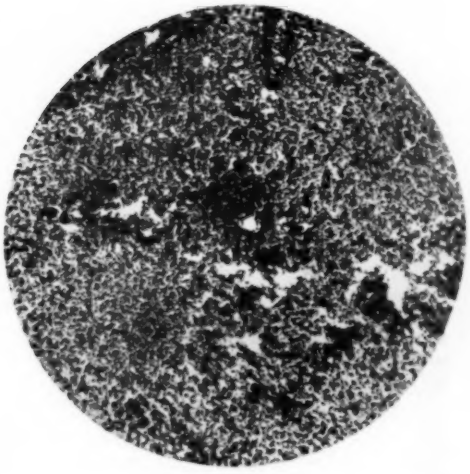

FIG. 1—Section of liver from Case No. 4 stained with hæmatoxylin and eosin under low power.

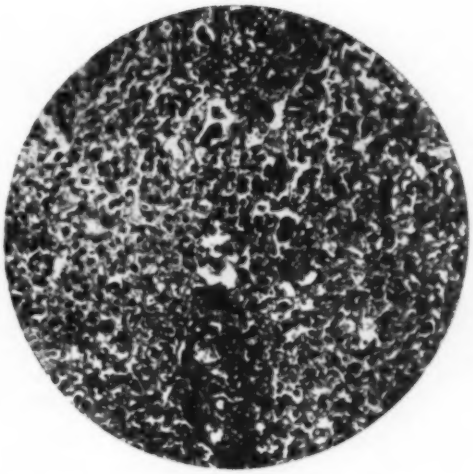

FIG. 2—Section of liver from Case No. 4 stained with hæmatoxylin and eosin under high power.

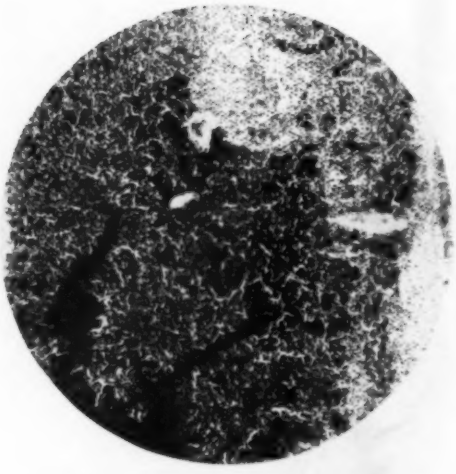

FIG. 3—Section of liver from Case No. 5 stained with Giemsa's stain under low power.

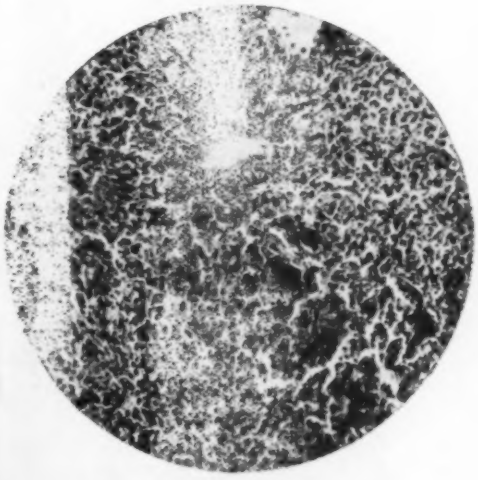

FIG. 4—Section of liver from Case No. 5 stained with Giemsa's stain under high power.

PLATE II

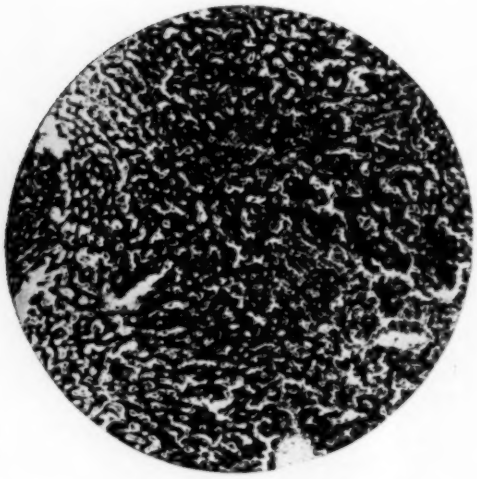

FIG. 5—Section of liver from Ca[illegible] stained [illegible] haematoxylin and eosin [illegible] low power.

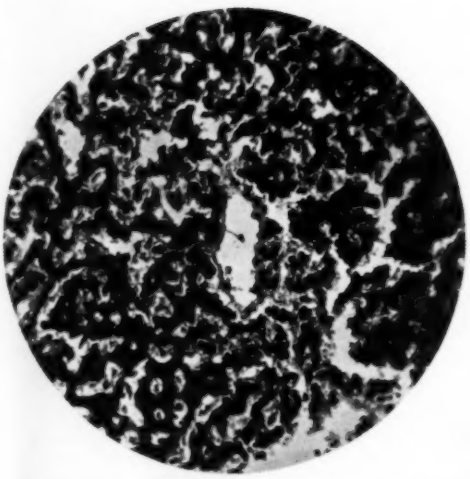

FIG. 6—Section of liver from Case No. 6 stained with haematoxylin and eos[illegible] under high power.

[illegible]ERJEE ET AL—*Acute Hepatic Failure in Infective Hepat[illegible] with a Report of Six Cases*

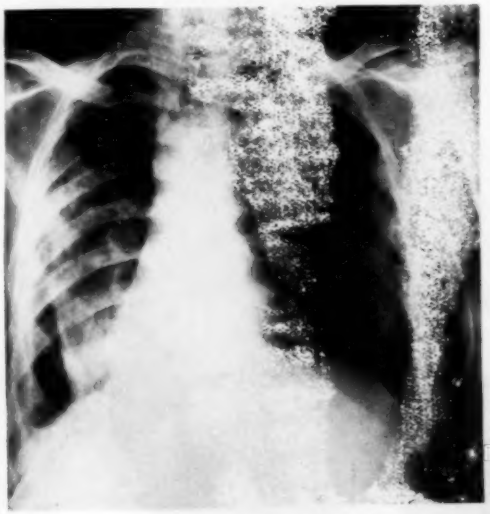

FIG. 1—Showing position of the catheter inside the superior vena cava (Case No. [illegible])

[illegible]—Showing further progress of the catheter and its entry into the right auricle (Case No. 1).

ND CHATTERJEE—*Technique of Cardiac Catheterisation*

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The spleen was not palpable. Rectal examination revealed no abnormality. No free fluid in abdomen was detected. Lungs—a few scattered rhonchi heard in both lungs. Heart—Nothing abnormal detected.

At midnight he was found to be boisterous and restless. Complained of severe pain in the abdomen, and vomited coffee-ground material. Next morning he was deeply unconscious. There was no neck stiffness. Kernig's sign—negative. No evidence of paralysis of the limbs. Pupils were contracted and sluggishly reacting to light. All tendon jerks were brisk and equal on either side. Abdominal reflexes—absent. Plantar reflex—no response. Passed urine in bed. Temperature 97°F. P/R—120/36 per minute. B.P.—114/60. Throughout the day his condition remained the same. Next morning his condition was worse. Pulse feeble and running—rate 160 per minute. Respiration rate 60 per minute. Pupils dilated and non-reacting. The lungs showed œdema. He expired at about 10 a.m. on 20th July 1950 about 40 hours after admission.

Laboratory Findings: Blood—Hb.—84%, R.B.C. —3·91 mill, per cmm. W.B.C.—9,800 per cmm. Neutrophils—78%, lymphocytes—18%, monocytes—2%, eosinophils 2%. No malaria parasites. Blood urea—28 mgm. per cent, N.P.N.—37 mgm per cent. Sugar—133 mgm. per cent. Chlorides—429 mgm. per cent. Cholesterol—83 mgm. per cent. Icteric index 87. van den Bergh—immediate direct. Prothrombin time—43 secs. Blood culture for leptospira—negative.

Urine—Acid. Sp. gr. 1.020. Albumin— ++ Sugar—nil. Acetone—nil. Bile salts and pigments present. Urobilinogen—nil. Deposit—R.B.C. in fair number. No crystals of tyrosine or leucine.

Treatment—Intravenous saline with 5% glucose and sodi bicarb (7½% 50 c.c. per pint of saline), vitamin K, vitamin C and calcium gluconate liberally, coramine, penicillin.

Post Mortem—A little tissue from the liver was aspirated through wide bore needle after death.

Histological examination showed marked necrosis of the liver cells. Only a few normal cells were seen at the periphery of liver lobules. Cellular infiltration was marked throughout the lobules specially around the portal tracts. The cells were mostly large and small round cells, neutrophils and plasma cells. (Figs. 3 and 4, Plate I).

Case 6—M., M.M. 45, a porter in the dock living in Kidderpore dock area, was admitted on 21st July, 1950 with a history of loose motions for 15 days, fever, anorexia, nausea and vomiting for 5 days; and hiccough and prostration since the morning of admission. Past history—dyspepsia off and on for 4 years.

On examination he was found to be of average build, poor nourishment and showed signs of dehydration. Eyes sunken. Tongue dry and coated. Moderate jaundice present. Temperature—97°F. P/R—128/48 per minute. Pulse feeble. Patient was conscious and restless. Pupils equal and reacting. Tendon jerks—sluggish. Abdominal reflexes—absent. Plantar reflex—dexor. Abdomen—distended, tenderness over left side. Liver—palpable, 1 finger and tender. Spleen—not palpable. Lungs—no abnormality. Heart sounds—feeble. Next day the patient became more restless, delirious and gradually passed into coma. Temperature rose and eventually he expired 32 hours after admission with hyperpyrexia and pulmonary œdema.

Laboratory Findings: — Blood — Hb. — 66%, W.B.C.—1,800 per cmm. neutrophils—48%, lymphocytes—46%, monocytes—6%, eosinophils—nil. No malaria parasites. Blood sugar—137 mgm. per cent, urea—110 mgm. per cent. N.P.N.—75 mgm. per cent. Cholesterol—170 mgm. per cent. Chlorides—387 mgm. per cent. Icteric index—18 units, van den Bergh—delayed direct. Prothrombin time—1 min. 5 sec. Blood culture for leptospira—no growth.

Urine—Acid. Albumin—a trace. Sugar—nil. Acetone—nil. Bile salts and pigments—present. Urobilinogen—strongly positive. Deposits—hyaline casts. No crystals of tyrosine and leucine.

Stool—Liquid, yellow. Microscopical examination —No cellular exudate. No protozoa, cysts or ova found.

Treatment: Intravenous saline with glucose and alkalies, vitamin K, vitamin C and calcium, penicillin and circulatory stimulants.

Post-Mortem: Histological examination of the liver, obtained post-mortem by needle aspiration, showed central zonal necrosis. The liver lobules were clearly recognisable. The sinuses were widely dilated and congested. Only slight cellular infiltration was seen around the portal tracts. (Figs. 5 and 6, Plate II).

DISCUSSION.

The six cases described above presented a more or less similar clinical picture. The onset and the preicteric stage in all cases were typical of cases of infective hepatitis. The early symptoms were not severe enough to make hospitalisation necessary in any of the cases. Diagnosis in the early stages was uncertain. The onset of grave symptoms was sudden and without any warning. Cerebral symptoms marked the onset in all cases except No. 5 and 6 where melæna and hæmatemesis, and prostration, hiccough and dehydration were the first symptoms of gravity. The cerebral symptoms seemed to start with incoherence, delirium, restlessness and gradually passed on to deep coma. There was no constant nervous findings which could be called characteristic. Lumbar puncture was done in one case (Case 2). C.S.F. was found to be under normal tension and clear. Cases 4 and 5 were boisterous at times, but convulsion was not seen in any case.

The grave symptoms started on the 3rd to the 8th days in the first five cases and in the sixth, there was a history of 15 days' illness before the patient showed serious symptoms.

Deep jaundice was present in all cases. van den Bergh reaction was immediate direct in all cases except Case 6 which showed delayed direct reaction. Icteric index varied from 18 to 200. Urine contained bile in all cases.

On admission the liver was not palpable in 4 cases and was palpable 2 fingers and 1 finger below

costal arch in 2 cases. The spleen was not palpable in any case. In the early stage the liver and spleen were palpable in Case 2.

As mentioned before, acute functional failure of the liver is shown by low blood proteins, low blood urea, with increase of ammonia and amino acid nitrogen in urine, hypoglycaemia and prolonged prothrombin time. It was not possible to do the various liver function tests or to do detailed biochemical examination of blood and urine in all cases. In Case 4 this was done more elaborately. Marked hypoglycæmia (25 mgm. per cent) was seen in one case (Case 4). In Case 5 and Case 6 blood sugar was above normal. In the first 3 cases blood sugar estimation was not done. After serious hypoglycæmia was seen in the 4th case, the subsequent two cases were given liberal transfusion of glucose solution from admission. This may explain the relatively high blood sugar level in these patients. Plasma protein estimation was done only in one case (Case 4). Total protein was found to be within normal limits but albumin was diminished. Blood urea was estimated in 3 cases and was found low in two cases but was high in the 6th case. The latter also showed a high N. P. N. in blood. This man had suffered from diarrhœa for 15 days and vomiting for 5 days before admission. He was also an aged man with poor cardiorenal reserve. These factors may be responsible for his azotæmia. Incidentally, his liver showed least damage on histological examination compared with the other two cases examined (Figs. 5 and 6, see Plate II). Blood chlorides were low in all the three cases examined (Cases 4, 5 and 6). This was probably due to vomiting.

Prothrombin coagulation time was estimated in the last three cases. It showed considerable increase in all cases. As much as 3 minutes was recorded in Case 4.

Urine showed presence of albumin and bile in all the cases. The centrifuged deposits on microscopic examination showed red blood cells in 2 cases, hyaline casts in 3 cases and granular cast in one case. Tyrosine crystals were seen in two cases.

The chief differential diagnosis lay between infective hepatitis with acute hepatic failure or massive necrosis of liver of unknown etiology, malignant malaria and Weil's disease.

The onset and early preicteric stage with mild fever and gastrointestinal symptoms are typical of infective hepatitis. In the early stages almost all the cases were treated for malaria without any effect and malaria parasites were not found in any of the cases.

The early mild symptoms, absence of muscular pain and hæmorrhages, were against a diagnosis of Weil's disease. In this condition the failure of kidney function is more common than hepatic failure, and high blood urea and N. P. N. are commonly present. Attempts at demonstration of the leptospira in centrifuged urinary deposits and blood were unsuccessful. Blood culture for leptospira was done at the Calcutta School of Tropical Medicine in Cases No. 4, 5 and 6 and was negative in all cases.

Massive necrosis of the liver was confirmed by the post-mortem examination in Case 1 and from the histological examination of liver tissue obtained from Cases 4 and 5. In the last case (No. 6), the hepatic necrosis was not of a massive character. Yet the clinical picture and history were very similar to that of the other cases. His prothrombin time was more than 1 minute, showing marked liver dysfunction. As mentioned before, renal failure or extrarenal azotæmia perhaps added to the clinical picture and ultimate fatal result in this case.

Marked cellular infiltration in the portal tracts and in the liver lobules in Cases 4 and 5 and to a lesser degree in Case 6 confirmed a diagnosis of infective hepatitis as the cause of hepatic necrosis and failure.

Summary

1. Relation of acute hepatic necrosis of indeterminate origin and infective hepatitis has been discussed.

2. Possible explanation of the occurrence of severe necrosis of liver in infective hepatitis, which is usually a benign condition has been discussed.

3. Clinical features and the mechanism of hepatic failure have been described.

4. Six fatal cases of acute hepatic necrosis have been described, their differential diagnosis has been discussed and their symptoms and signs have been analysed.

5. The line of treatment has been outlined.

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THIAMINE HYDROCHLORIDE INJECTION AND ITS PHYSIOLOGICAL AVAILABILITY

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Thiamine hydrochloride is being largely used now-a-days in clinical therapy. As injection it is a sterile solution of thiamine hydrochloride in water. This vitamin is often susceptible to both oxidation and reduction in solution and as such the injection often contains an excess of the labelled amount (*cf.* U.S.P. XIII.). The ampoule should not only retain the amount of vitamin claimed but must also be physiologically active. Chemical assay would give an idea of the amount of vitamin present but due to its inherent characteristics it is often argued that the injections as found in the market might not be equally available for the system. Biological assay with animals is expected to give the true picture of the physiological availability of the vitamin in any random sample of a pharmaceutical preparation. As such a freshly prepared solution made from a standard thiamine hydrochloride in freshly distilled water suitable for parenteral administration was compared with two preparations—one from a foreign and the other from an indigenous manufacturer. They were assayed by usual curative test taking the pigeon as the experimental animal. The assays were repeated and compared by growth measurements taking ducklings as experimental animals because of their rapid growth compared to their relatively small initial weight.

Materials Used

A. Standard solution of thiamine hydrochloride prepared according to U.S.P. XIII.

B. Thiamine hydrochloride in ampoule from a foreign manufacturer.

C. Thiamine hydrochloride in ampoule from a local manufacturer.

Biological Assay

(*a*) *Experiment with pigeons*—A group of pigeons purchased from the local market and weighing 289-300 gms. were kept in individual mosquito-proof wire-netted cages for observation for 7 days. Thereafter they were placed on a diet containing autoclaved rice only. Water was supplied *ad libitum*. Since highly polished rice was unavailable, ordinary rice was made vitamin-free by two successions of autoclaving, each for one hour at 20 lbs. pressure. Symptoms of polyneuritis as shown by retracted neck began to show after 10-15 days. Only one-third of the animals under diet showed polyneuritic symptoms and were selected out for the test. Animals in relapse after a treatment were taken over for cross-over testing.

The individual test samples were suitably diluted in an aseptic way and kept in sterile neutral and resistant bottles in the refrigerator. The stock solution of both the samples was such as to contain 100 micrograms of thiamine hydrochloride per c.c. and equivalent to 33·3 I.U. Feeding was made with a standard 0·2 c.c. Kahn pipette and additional 2 c.c. sterile water was given to wash down the contents into the stomach of the animal. Table I summarises the results of these experiments. The last figures in both the groups indicate that the animals cannot survive when the effective dose is lower than 1·65 I.U.

Table I

Preparation	*Dose equivalent in I.U.*	*Pigeon No.*	*Result of Treatment*	*Period of Cure in days*
B				
Thiamine hydrochloride in ampoules (foreign)	6·6	55	Cured	6
	3·3	56	„	5
	1·65	*40	„	3
	„	50	„	1
	0·66	51	Dead	0
C				
Thiamine hydrochloride in ampoules (local)	6·6	39	Cured	6
	3·3	36	„	6
	1·65	*56	„	5
	„	40	„	3
	„	*50	„	2
	0·66	60	Dead	0

* Animals used after relapse in cross-over test.

(*b*) *Experiment with ducklings*:—The ducklings received from the hatchery were 2-5 days old and were housed in wire-mesh cages. Out of the 14 animals 12 were given a simplified ration consisting of autoclaved rice powder 75%, casein (vitamin-free) 11%, salt mixture (U.S.P. No. 2) 4%, arachis oil 6%, cod liver oil 2%, liver extract (specially prepared 2%), and vitamin mixtures† both fat soluble and water

† Riboflavin 200 mgm., calcium pantothenate 400 mgm., nicotinic acid 1000 mgm., and pyridoxine 100 mgm. dissolved in 250 c.c. alcohol, α-tocopherol 1000 mgm. and menadion 10 mgm. were dissolved in 100 c.c. arachis oil. 10 c.c. of the first mixture and 5 c.c. of the second mixture were taken for each kg. of the diet.

soluble (excepting thiamine) as used by Roos *et al* (1946) with distilled water *ad libitum*. Two other animals were kept as control. After 7 days on this diet the animals ceased to gain in weight and though the classical symptoms of polyneuritis were not exhibited the animals became weak and found difficulty in walking. These thiamine-depleted animals were then divided into three groups and each of the animals was given an oral dose of 0·5 mgm. of vitamin B_1, as supplement (preparations for three groups) daily at the beginning but on every alternate day after 6 days. The weight gains during the repletion period are summarised in Table II.

TABLE II—SHOWING EFFECT OF FEEDING THIAMINE HYDROCHLORIDE ON THE GAIN IN WEIGHT DURING REPLETION

Preparation	*Duck No.*	*Weight gain during repletion in gms.*			
		3 days	*6 days*	*8 days*	*10 days*
A	3	15·8	32	39	43
Standard solution of thiamine hydrochloride (U.S.P. XIII).	9	27·5	42	40	41
	11	15·5	20·8	35	37
	12	22·0	34·5	41·6	48·2
	mean	20·2	32·3	38·9	42·3
B	2	14	32	23	34
Thiamine Hydrochloride in ampoules (Foreign).	4	28	16	32	30
	5	21	51	57	53
	10	14	25	37	41
	mean	19·35	31·0	37·2	39·5
C	1	29	31	27	24
Thiamine Hydrochloride in ampoules (Local).	6	16·5	30·5	35·5	32·5
	7	21·0	32·0	39·0	37·0
	8	15·0	38·0	37·0	46·0
	mean	20·3	32·8	34·6	35·0

CONCLUSION

The results from both sets of experiments indicate that the thiamine hydrochloride in each case responded well and was quite available to the animals. The slight differences in the weight gain after 8 days in the duckling experiment and in the period of cure in the pegion experiment are not significant.

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SURGERY IN NON-PULMONARY TUBERCULOSIS IN INDIA

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It is unfortunate that there is an increasing frequency of non-pulmonary tuberculosis of the abdomen, glands, bones and joints in India. In the town of Udaipur where I practise I have come across a very large number of cases suffering from tubercular adenitis of the neck and of the abdomen. The latter is mostly of a localised type at the cæcum but not infrequently extending up to the ascending colon and very often involving the last portion of the ileum near the ileo-cæcal junction. In some cases it extends up to the transverse colon but luckily it is mostly localised, forming into nodular masses and rarely accompanied by exudative peritonitis and miliary tubercles scattered over the small and large gut. No surgery is of any avail in cases with exudative peritonitis leading to ascites and miliary tubercles over the gut. Surgery is also not of much help when there is extensive involvement of mesenteric glands.

Abdominal Tuberculosis

Abdominal tuberculosis as observed by the author during 15 years of surgical practice can be classified as follows:

Group A—(1) Localised tuberculosis of cæcum easily amenable to surgical treatment.

(2) Localised tuberculosis of cæcum with mild extensions to the ascending colon and ileum. This group is also amenable to surgical treatment.

(3) Localised tuberculosis of cæcum with extensive involvement of ascending colon, transverse colon and ileum. These cases can obtain some relief through surgery. In all these three groups of cases there is no exudation in the peritoneal cavity nor presence of scattered miliary tubercles (sago-grain-sized nodules) over the small and large gut. And it is for this reason that these cases can be helped through surgery. The glands though affected remain localised to the corresponding portion of the gut involved. Extensive involvement of the glands usually give rise to exudative peritonitis.

The main complaints of the patients under these groups are attacks of mild or severe colicky abdominal pains, mostly referred to the umbilical region and the right lower abdomen.

The main symptoms are of incomplete obstruction of the gut-lumen, giving rise to frequent distension, inhibition of the passage of flatus, belching and epigastric discomfort and distension after meals. These complaints are most marked after meals. The cases are mostly afebrile.

Group B—Extensive involvement of the mesenteric glands which can be palpated as nodular masses in the abdomen. Surgery is of no use in these cases and they run hectic temperature which is sometimes quite high in the evening. And for this reason, too, surgery is out of question. They are very amenable to streptomycin injection, 1 gm. daily in two divided doses; ½ gm. in the morning and ½ gm. in the evening. A course of 40-50 gm. is necessary and in some cases even more injections may be needed. The first course is usually of 21 days with 21 gm. which may sometimes have to be interrupted owing to symptoms of vertigo, nausea, belching and epigastric pain. The second course is given after a period of 7-10 days. Sometimes 3-4 courses are required. The patients definitely improve. They become afebrile, are relieved of abdominal pain, and the glandular nodules disappear as far as clinically ascertainable and they gain in weight. R.B.C. count increases. Their look becomes healthier. The sedimentation rate of the blood improves.

Group C—(1) *Exudative tubercular peritonitis leading to ascites.* Nodular masses can be felt on deep palpation and especially after the peritoneal fluid is tapped off by Southey's trocar and canula. The patients are weak and emaciated. They run mild hectic temperature and lose weight. They suffer from abdominal pain which usually disappears when they develop ascites. It seems that with the development of fluid in the peritoneal cavity the rub in between the peritoneal surfaces disappears and the patient finds relief from pain. But if he had obstructive lesion of the lumen of the gut, he wil continue suffering from colicky pains. I have not tried streptomycin in these cases.

(2) *Generalised miliary tubercles scattered over gut.* Clinically it is difficult to diagnose these cases. They complain of vague pains in the abdomen and sometimes get mild fever. If kept under strict observation, and correct records of temperature, pulse and weight are kept, then diagnosis is probably easy to establish; but usually they are walking patients who do not get themselves admitted in the hospital. The mild fever coming now and then is easily confused with chronic malaria in our country. A word about S. R. of blood may not be out of place here. S. R. of blood has no diagnostic value. It helps to judge the progress of the case. There are cases in whom it is very difficult to differentiate between the two conditions of tuberculosis of cæcum and chronic appendicitis. X-ray too does not prove of much value. S.R. of blood is high. Very usually the abdomen is opened with the diagnosis of chronic appendicitis and then the real condition is revealed.

Surgery in Group A—The cases under this group are easily amenable to surgical treatment. Usually a small soft mass is felt in the right iliac fossa, but not always. X-ray does not always help to differentiate the two confusing conditions of chronic appendicitis and T. B. cæcum. Many times it has been seen that the x-ray diagnosis of chronic appendicitis was reverted on opening the abdomen and the patient had a tubercular lesion of the cæcum and *vice versa*. The filling defect of cæcum after barium-meal or enemata is possible in both the conditions.

The abdomen is opened by Mac-Burney's incision and if tuberculosis of the cæcum is found it is enlarged

by a vertical cut along the lateral border of rectus over the rectus sheath. The incision can conveniently be enlarged to permit resection of cæcum or performing colostomy. In cases where the lesion is localised to cæcum, the resection of the cæcum is done establishing end-to-end anastomosis between ileum and ascending colon and a second side-to-side anastomosis between ileum and transverse colon. In cases where the lesion is extensive, ileocolostomy (between ileum and transverse colon) alone is done. The patients are in poor health and do not permit of extensive resection which entails major operative risk. In one case the lesion involved the whole of the transverse colon and ileocolostomy had to be established between ileum and descending colon. The patient seen about 4 years after the operation is free from any complaint and is in good health.

RESULTS—The post-operative results are very encouraging. The cases have an uneventful recovery after the operation. The complaints of colic and flatulence disappear and the patients gain in weight. Many cases which were operated on several years back, are now in active life and have resumed their normal occupation. The usual anti-tubercular treatment of codliver oil with malt, calcium and nourishing diet including fruits and vegetables are prescribed.

Recently one or two courses of streptomycin are given after the operation which help in early recovery and return to health and more so in cases with extensive involvement of the ascending and transverse colon. In the latter series of cases, sometimes mild pain persists after the operation and it has been experienced that oxygenation of the peritoneal cavity for sometime after the operation gives perfect relief from pain. I am convinced that ileocolostomy alone or combined with resection of the cæcum where permissible is a very good relief-giving measure in these cases of localised tuberculosis and without any danger of complication. I have so far operated about eight cases and almost all of them had uneventful recovery.

T.B. ADENITIS OF THE NECK

This affection in children and adults is also quite common. The usual anti-tubercular treatment with codliver oil preparations and tuberculin had good success in some cases but it needs an experienced and specialised man to undertake tuberculin treatment. Such a practitioner is not available in most of the towns in India. During the last three years I have tried in these cases a plaster of Paris collar aroun.l the neck and in many cases I had astounding success. I remember a few cases with suppurative glands in whom the neck was immobilised with plaster collar and within 2-3 months the ulcers healed and the glands decreased in size. Another application of the plaster collar for a further period of 3-4 months led to good recovery.

The usual treatment for tuberculosis is given side by side. Cases when the glands are very big and forming into big bunches are first surgically removed and then the neck is immobilised in plaster of Paris collar. This has prevented recurrence of the condition which is so common.

Before the plaster of Paris collar treatment I had many cases in whom I had to operate several times for recurrence of the condition either on the same side or on the opposite side. It was observed that the flare up of glands on the opposite side of the neck was quite a common feature after the operation. The plaster collar treatment has remarkably controlled the recurrence after operation.

The neck is completely immobilised by a collar of plaster of Paris which envelopes the neck, extends up to lower jaw and chin and over both the shoulders and under both the arm-pits. It is kept for 2-3 months and repaired if cracked or broken. It is removed after 2-3 months for inspection and another collar re-applied. The usual period needed for the collar treatment is about 6 months. I have no experience with x-ray therapy of glands.

TUBERCULOSIS OF THE SPINE

The tubercular affection of the spine is also seen quite frequently. The usual treatment of plaster jacket and splints are so foreign to our people that they do not easily agree to this treatment of invalidity, because they do not know that the disease in due course will make them a perfect invalid and may also prove fatal. During the last two years I tried Albee's operation of bone graft from the internal surface of the tibia. The results in cases without cold abscess and sinuses have been satisfactory. In one case with T.B. sinus with involvement of last two thoracic and first lumbar vertebræ the operation was tried but the graft did not take and had to be removed later on. In another case with closed psoas abscess as evident in x-ray picture, the operation was performed. I saw the patient two years after the operation in December, 1949 at Bombay and was happy to note that she had fully recovered and was gradually returning to normal life.

There are cases of old tuberculosis of the spine in whom the deformity of kyphosis is present and a straight bone graft is not possible in such cases. It has been suggested for these cases that on the non-periosteal surface of the bone graft a number of transverse saw-cuts should be made and then bent into the desired shape, but in my experience this does not give a satisfactory curve of the bone graft and there is also the danger of breaking it by too much bending. In one case I actually broke the graft while bending it and then it could no more serve the purpose for which it was meant.

It led me to think as how best to solve this difficulty. I thought of employing graft from the rib which had a natural curve. A piece of rib as required is removed. It is usually 5-6 inches in length. Two spines above and two below the lesion are included for applying the graft. The spines are bifurcated by Albee saw and the graft laid in with the convex surface of the rib graft facing dorsally. The graft is usually

(Concluded at foot of col. 1, page 142)

THE PRESENT STATUS OF ANTI-MALARIAL DRUGS AND THE FUTURE OF CINCHONA IN INDIA

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Cinchona alkaloids were known through centuries as the only proved remedies for malaria, but the synthetic anti-malarial drugs, discovered and put into the market in recent years, have now seriously challenged their position. Attempts for preparing an equivalent or better substitute for quinine were stimulated by the acute shortage of quinine during the last war and thousands of synthetic compounds were prepared and tested in the hope of discovering an effective antimalarial. Mepacrine (atebrin), pamaquin (plasmochin), paludrine (proguanil or chlorguanide) and chloroquin may be regarded as the chief discoveries in the field of synthetic anti-malarials. The production of mepacrine (atebrin), which had been discovered in Germany some years ago, was undertaken on a large scale in the U.S.A. and Britain during the war years. Paludrine which came into the market in 1945 has since received a vast amount of publicity and is now being imported in large quantities in India. Chloroquin is still not available freely or in large quantities in this country, but increase in its production is being anticipated. The other synthetic antimalarials of importance are pamaquin, pentaquin and certain other amino quinolines which are recommended for use mainly as supplements to quinine or the other antimalarials mentioned above for the complete eradication of the disease. With the return of more normal conditions in the Indonesian islands, quinine is again available freely. We, therefore, now find the four drugs, quinine, mepacrine, paludrine and chloroquin in the competitive market.

The choice of an antimalarial drug is of importance to any country where malaria is a menace and requires to be brought under control. For India, the problem has a special significance. Here malaria claims about 150,000,000 patients every year and its treatment would consequently require an enormous amount of anti-malarial drug. The dangers of depending on external sources of supply for this essential commodity were revealed during the last war. Whatever be the anti-malarial decided upon, India will have to produce her own needs and this consideration should weigh in coming to a decision. At the same time it should be remembered that cinchona grows on Indian soil, that quinine is being produced in considerable quantities in this country and that surveys carried from time to time have shown that its production is capable of expansion so as to meet the local demands.

The general findings of the workers in the field of antimalarials regarding the status of quinine *vis a vis* mepacrine, paludrine and chloroquin, as found in the recent literature, is being reported briefly in the following paragraphs.

Prophylaxis Against Malaria

For *P. vivax* infection (benign tertian malaria), none of the above drugs can act as a true causal prophylactic.

For *P. falciparum* infection, either mepacrine or paludrine (Colonial Medical Research Committee's Recommendation, 1949), in a dose of 100 mgm. daily, generally prevents fever. A similar effect is also produced by taking a daily dose of 5 grains of quinine (Wells, 1948) or a weekly dose of 0·25 gm. of chloroquin. But in either case, the action is of suppressive nature. Paludrine has been proved to be a true causal prophylactic for one African strain of *P. falciparum* (Covell, 1949) but the same cannot always be said of other strains (Leading Article, *Brit.M.J.*, **1**:106, 1949). On the other hand stranis of *P. falciparum* have been found in Africa (Covell, 1949), Aden (Kay, 1949) and in India (Chaudhury, 1948) which are resistant to paludrine.

For true prophylaxis against malaria, the drug should be capable of destroying the parasite immediately after its entry into the blood, after a mosquito bite. The parasite is then in the sporozoite form and none of the above antimalarials are known to be effective against this form (Basu and Mukherjee, 1947). The sporozoites remain in the reticulo-endothelial tissues of the liver and spleen during the incubation period and thereafter the erythrocytic cycle sets in. The antimalarial drugs, taken in prophylactic doses, generally attack the parasite at this stage, and thus prevent the clinical manifestations of the infection. A true causal prophylactic drug for all type of malaria or even for all strains of malignant tertian malaria has still to be discovered.

Treatment of Acute Attacks

For terminating an acute attack of benign tertian malaria, quinine, mepacrine, paludrine and chloroquin have all been found to be effective but none of them can prevent relapses altogether. For treating acute attacks of malignant tertion malaria, mepacrine is generally preferred. There is now general agreement among workers from various parts of Africa and Asia that paludrine acts more slowly than either mepacrine, quinine or chloroquin. Combination of quinine or mepacrine with paludrine hastens the fall of temperature and shortens the duration of parasitæmia. Recent evidence points points to the superiority of chloroquin over the other three in the treatment of malignant malaria, its action being quicker.

Eradication of the Infection

In the treatment of benign tertian malaria with quinine or the synthetic antimalarials, eradication of the disease often takes place but relapses occur in a considerable proportion of the cases treated. Eradication of *P. Vivax* infection is still an unsolved problem in malaria therapy, but best results are said to be obtained by a combined treatment with quinine along with a pamaquine or pentaquin. Relapses may also be controlled by the regular use, in suppressive doses, of

either of the drugs, *viz.*, quinine, mepacrine, paludrine or chloroquin.

For the eradication of *P. falciparum* infection, mepacrine has been found to be more effective and quicker in action than either quinine or paludrine. In India, strains of *P. falciparum* have been found (Chaudhury, 1948) which give rise to infections not radically cured by paludrine in doses of 300 mgm. for 10 days. Similar observations have also been made elsewhere. Suggestions have therefore been made for using quinine or mepacrine along with paludrine in the initial stages of the treatment. Chloroquin has now been claimed to eradicate *P. falciparum* infection in a total dose of 2·5 gms. spread over three days

Drug Resistance

Quinine or mepacrine has never been found to produce drug resistance in any strain of malarial parasites, nor is there any evidence that particular strains possess any natural resistance against these drugs. The same, however, cannot be said of paludrine. In Aden protectorate paludrine has been found to be almost totally useless for the treatment of most cases of malignant tertian malaria due to naturally occurring paludrine-resistant strains of *P. falciparum*. Further, the work of Seaton and Lowrie has shown (Seaton and Lawrie, 1949) that a high degree of resistance to paludrine can be produced in strains of both *P. vivax* and *P. falciparum* by giving sub-curative doses of the drug to a series of patients in whom the strain was maintained by blood inoculation. The resistance was unaffected by mosquito transmissions. A similar observation was made by Hawking and Perry (1949) in a strain of monkey malaria, where the resistance was increased by a thousand times. Although the results obtained under experimental conditions may not be reproduced as such in the clinical treatment of malaria with paludrine under field conditions, the possibility of the gradual development of acquired resistance to paludrine by strains of malaria in endemic areas cannot be ruled out.

Toxicity

Quinine is generally non-toxic in therapeutic doses, but certain individuals have an idiosyncrasy for this drug. Such cases can often be treated with another cinchona alkaloid, *e.g.*, quinine, without any untoward effect. Mepacrine generally produces a temporary pigmentation of the skin and the mental symptoms, developed, have made it somewhat unpopular in this country. Paludrine has been claimed to be the least toxic of the three and this has been the most important argument advanced in favour of this drug. But this claim (of non-toxicity), like many others put forward initially for paludrine, is now being challenged. There have been complaints of loss of appetite, reduction in weight and lack of energy from some of those who have taken paludrine for considerable periods in prophylactic doses (Seearer, 1949). Chloroquin which has been clinically tested in this country only recently (Chaudhury *et al*, 1948), has been found to produce toxic symptoms in 10 per cent of the cases, but the toxicity was mild and of temporary character.

There was a belief that treatment of malignant malaria with quinine was responsible for occasional occurrences of black water fever. It is however now established that this is not correct. The irregular use of antimalarials during an infection of *P. falciparum* is now considered to be a factor in the onset of black water fever and consequently its occurrence is as likely with mepacrine or paludrine as with quinine. Cases where black water fever started while being treated with mepacrine are on record. The uncertainty of the efficacy of paludrine in this type of malaria has led to doubts about its ability to control black fever in West Africa.

Table Showing Doses and Costs of Antimalarial Drugs

Antimalarial drug	*Type of infection*	*For suppressive action* Dose required	Cost (Weekly) Rs. A. P.	*For treatment of an acute attack* Dose required	Total Cost Rs. A. P.
Quinine (Sulphate)	B. T.	5 grains daily	0 2 6·3†	90 grains*	0 6 6
	M. T.	" "	"	"	0 6 6
Mepacrine (Hydrochloride)	B. T.	0·1 gm. daily	0 6 1·8	0·6 gm.—0·1 gm.×3×4 days=1·2 gm.*	0 9 6·6
	M. T.	" "	"	"	0 9 6·6
Paludrine	B. T.	0·1 gm. daily (or 0·3 gm. weekly)	0 2 3·3 or 0 0 11·7	0·1 gm.×3×10 days =3·0 gm.§	0 9 9
	M. T.	" " "	"	0·3 gm.×2×10 days =6·0 gm.	1 3 6
Chloroquin (Diphosphate)	B. T.	0·25 gm. weekly	0 3 8·4	1·5 gm.‡	1 6 0
	M. T.	" "	"	2·5 gm.	2 5 0

† A tube of 9 tablets, 5 grains each, of W. Bengal Government, costs annas 0-3-3.
* Recommendation of the Malaria Chemotherapy Committee, sponsored by the Government of India.
§ Recommendation of the Colonial Medical Research Committee (*Brit. M. J.*, 1:585, 1949).
‡ *J. A. M. A.*, **136**:1049, 1948.

Dosage and Cost

In a country like India, where poverty and disease exist side by side, the cost of a drug is an important consideration in its choice. For comparison, one must take into account the cost of equivalent quantities of the different drugs, *i.e.*, those producing equal therapeutic effect. But here it is difficult to be exact, because opinions often differ regarding the doses required, *e.g.*, for terminating an acute attack of B.T. or M.T. malaria orf or effective suppressive action, in respect of the different antimalarial drugs. The prices also vary to some extent according to brand or packing. The quantities of quinine, mepacrine, paludrine and chloroquin required for suppressive or curative action in non-immune adults and their approximate costs are given in the annexed table.

The figures in the table show that quinine is the least expensive for a course of treatment for an acute attack of malaria while paludrine is slightly less expensive when taken in suppressive doses. For the treatment of an acute attack in semi-immune cases, however, smaller doses of paludrine have been stated to be useful; *e.g.*, a single dose of 1·3 gm. (Colonial Medical Research Committee's Report, 1949) or a total of 1·8 gm. in five days (Indian Malaria Chemotherapy Committee's recommendation) is said to control the attack. On the other hand, in non-immune cases, the cost of a course of treatment of an acute attack of malignant malaria with paludrine would be higher than the figure given in the Table, as the latter does not take into account the cost of 0·3 gm. of mepacrine which should be given on the first day, according to the recommendations of the Colonial Medical Research Committee.

General Remarks

It will be clear from the above that each of the antimalarials under survey has its usefulness and limitations and that none of the synthetics can claim definite superiority over quinine, when all aspects are taken into consideration. There is no case for supplanting quinine with another drug as yet, although it must be admitted that the alkaloid and the synthetics can supplement each other's action, with advantage, in many cases.

The Future of Antimalarials in India

India has been producing quinine, and the indigenous cinchona industry can be expanded if desired, to meet the country's entire need. Until recently, it was the declared policy of the Government of India to increase quinine production although practice had fallen short of intention. But now it is reported that the Government have decided to set up a factory for the manufacture of paludrine, jointly with the Imperial Chemical Industries, at a cost of several crores of rupees. A curtailment of the cinchona industry also appears likely. This decision involves a major policy and affects the health and welfare of millions of our countrymen and as such should be subjected to careful scrutiny.

The following points need consideration in determining the antimalarials policy to be adopted by the Government:—

(1) For the manufacture of paludrine, the starting materials are not all available in India, and will have to be imported from abroad. Hence, this will not eliminate dependence on other countries for an essential and strategic material in times of emergency.

(2) The manufacture of paludrine under the present conditions will involve a considerable drain on our foreign exchange on account of the cost of imported materials and also profits, dividends and remuneration due to the foreign partners and foreign technical experts.

(3) Better synthetic antimalarials than paludrine are likely to come into the market in the near future. Chloroquin is already a promising drug. It should be considered whether we should be committed to the production of a drug whcih is likely to become out-of-date even before its production starts.

(4) India will need an all-round development of her heavy and fine chemical industries before she can undertake the large-scale manufacture of synthetic drugs, without being unduly dependent on foreign resources. There is an urgent need for the Government and industrialists in this country to devise means for bringing about such development in the shortest possible time.

(5) At the present moment there is no emergency so far as antimalarials are concerned, since quinine, mepacrine and paludrine are all available for import. It should, therefore, be quite possible to wait for the present and see which of the synthetic antimalarials comes out best after trials, and in the mean time concentrate on the deveopment of the basic and fine chemical industries of the country.

(6) The manufacture of quinine from cinchona bark can be carried out with chemicals available in this country. The present out-put is far short of the total requirements, but increase of production can be effected on the strength of the country's own resources.

(7) The cost of production of quinine can be reduced by adopting improved methods of cinchona cultivation, which would increase the quinine content of the bark, since richer bark is cheaper to extract. Modifications in the manufacturing processes are also likely to lead to more economical extraction. All these require systematic research for improvements in cultural and manufacturing methods.

(8) It should also be possible to enhance the therapeutic value of quinine by suitable combinations or adjuvants. Recent work (Basu, Mukherjee and Banerjee, 1947) has shown that combination with bile salts increases the solubility of quinine at the pH found in the intestines and promotes its diffisubility

through membranes under this condition. This suggests that such a combination would lead to more efficient absorption of the drug and hence to better therapeutic effect. Researches in these and other directions, intended to discover potentizers or more effective derivatives coupled with clinical evaluation of the resultant modified products are necessary for achieving tangible results in this field.

Conclusion

The respective position of the synthetic antimalarials is still in flux. None of the antimalarials can yet claim definite superiority over quinine, we say taking all factors together. But present trends of researches would lead us to expect a better synthetic antimalarial in the not distant future.

Quinine has an established value in the control of malaria and it is also an indigenous product of India. Further reduction in costs of manufacture and enhancement of therapeutic value may be possible by arranging systematic investigations in various directions.

The establishment of a paludrine factory by the Government of India now appears to be inopportune. It will not really lead to self-sufficiency in respect of antimalarials. It would be wiser to wait till the industrial resources of the country are sufficiently developed to enable us to manufacture synthetic drugs independently of foreign help and till a decidedly better synthetic antimalarial drug has been discovered.

In any event the natural resources of cinchona alkaloids should be developed to meet the bulk of the local demand. Quinine is a time-tested drug and "is still our sheet anchor in the treatment of malaria. The newer synthetic antimalarials can be used, if necessary, to supplement it. Even if a definitely superior drug be discovered, quinine should be retained as a stand-by in case of emergency.

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TECHNIQUE OF CARDIAC CATHETERISATION—ITS ROLE IN DIAGNOSIS OF CONGENITAL HEART DISEASE

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Congenital anomalies of the heart are now coming to the surgical side. The surgeons with the help and co-operation of their fellow physicians are trying to bring relief to these distressed babies who are crippled from the very beginning of their existence.

Precise diagnosis as regards the exact nature of the malformation is now considered to be more important than before. Physical findings, interpretation of murmurs in various positions—their characteristics, the presence or absence of cyanosis, x-ray interpretation of the sizes of the different chambers of the heart, the electrocardiography help to a great extent to classify the various defects; but still on many occasions one has to stop at the simple diagnosis "congenital heart disease" because it becomes very difficult to put them into the one or the other group.

To a surgeon who is going to open the chest with a view to rectify a cardiac malformation, correct diagnosis becomes imperative to formulate his planned attack. Recently, the biochemist and the radiologist have come forward with their helping hands and in this procedure of cardiac catheterisation their part in helping a more precise diagnosis is great.

In our Hospital we are now trying to take up this method of investigation. This paper is only a preliminary report of our attempt at the technique of cardiac catheterisation which we have performed in some normal cases.

Role of Cardiac Catheterisation in Diagnosis

Because the oxygen content varies in different chambers of the heart as also the intracavitary pressure and because they have got a normal average for each chamber, any demonstrable variation in the oxygen-content or pressure will materially aid in diagnosis, specially in conditions of veno-arterial shunts. By inserting a radio-opaque catheter in these different chambers it is possible to record the intracavitary pressure and to draw samples of blood for the determination of their oxygen-content. By this method the determination of cardiac output can also be carried out. In case of interventricular septal defect or in intra-atrial communication the catheter can be negotiated with skill and experience from the right to the left side of the heart through the deficiency and samples of blood can be estimated. The catheter can also be passed from the right ventricle through the pulmonary orifice into one or other branches of the pulmonary

PLATE III

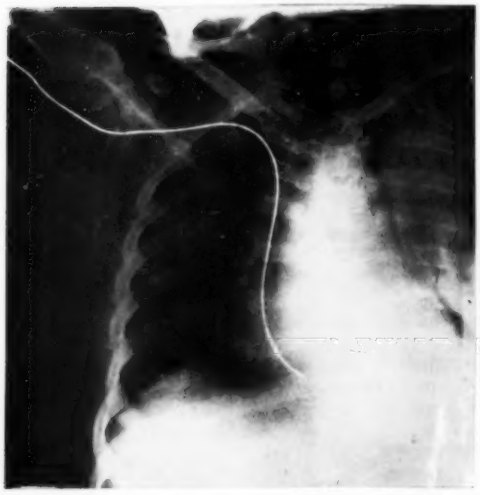

FIG. 3—Showing that the tip of the catheter has just entered inside the right ventricle (Case No. 5).

FIG. 4—Showing that the catheter instead of being directed towards the heart has gone up the internal jugular vein; it went as far as the transverse sinus (Case No. 3).

FIGS. 5 & 6—Showing the catheter in position after its introduction inside the heart; photo taken prior to its withdrawal.

PLATE IV

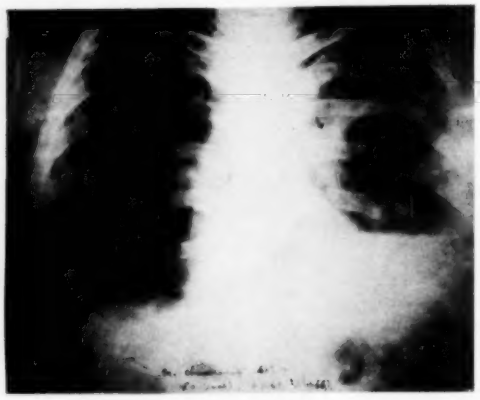

FIG. 1A—Postero-anterior view

FIG. 1B—

FIG. 2—

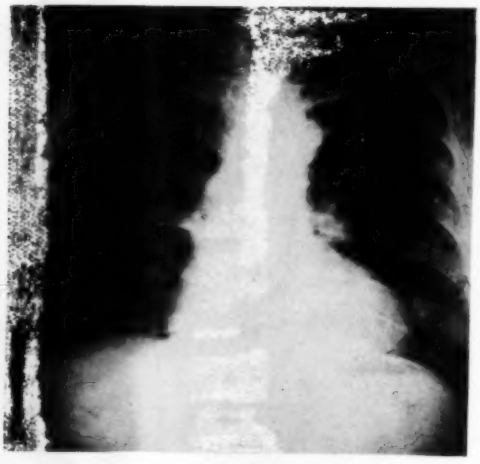

FIG. 3—Skiagram of 22-7-50

of Huge Putrid Lung Abscess Treated with Penicillin

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Bengal Autot[illegible] Co., Cal.

artery, and samples of blood can be collected with a view to find out any alteration in their oxygen-content in cases of patent ductus arteriosus.

Operative Technique

No premedication has been used with our patients. Under local anæsthesia an incision was made about an inch long in the right cubital region exposing the median cubital vein. After isolating the vein a V-shaped incision was made on its anterior wall; two ligatures were put, one proximal and the other distal to the incision on the vein, the proximal was tied and the distal one was kept loose.

A No. 6 radio-opaque ureteral catheter which was flushed and later filled with saline was introduced through the slit made; the catheter was gently pushed in; when it seemed to have passed through the axillary vein the arm was gradually abducted which helped to negotiate the bend at the axilla more easily. On progressing further when the catheter passed through the subclavian vein the head of the patient was flexed towards the operated side, at the same time the patient was asked if he felt any sensation in the neck, because, when the catheter reaches the termination of the subclavian vein it has a tendency to go up inside the jugular vein instead of coming down through the innominate vein. Sometimes the tip of the catheter can actually be palpated in the neck in thin subjects.

Once the catheter has entered the right innominate vein its further course through the superior vena cava into the auricle becomes relatively easy. When it has entered the right auricle it can be pushed further and made to enter the right ventricle through the tricuspid orifice. Any further course of the catheter can be guided by directing it upwards adhering to the left wall of the right ventricle, when it can be negotiated through the pulmonary orifice into the main stem of the pulmonary artery. (Figs. 1-6, Plates II and III).

Difficulties and Complications

One of the common difficulties that we have encountered was that the catheter instead of passing to the subclavian vein down the superior vena cava went up through the internal jugular vein. In one of our cases the catheter actually went right up into the transverse sinus; it was not followed subsequently, however, by any intracranial complication.

Local phlebitis of short segments of vein was another complication that occurred in two of our cases which however resolved in about a week's time.

Unexpected bradycardia set in in one case when we were just trying to pass the catheter from the auricle towards the ventricle in fact we could see the sudden slowing of the heart's action under the screen; this, however, responded quickly to a dose of atropine.

Acknowledgment

We are grateful to Prof. Subodh Datta, for his kind help and encouragement in carrying on this work. Our thanks are also due to Dr. Binode Behari Roy, Dr. Satyen Basu Roy and Dr. Jyoti Pyne for their help in the technical procedures.

ECTOPIC GESTATION

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In the *Indian Medical Gazette* of September, 1943 T. D. Rajoo and H. P. Maddimsetti wrote on ectopic gestation as follows:—

"Victor Bonney says that there is no class of case in which the symptoms supervene with more dramatic suddenness and intensity than in acute tubal rupture, nor any in which prompt and determined surgical measures are rewarded with more pleasurable success. Very true. But here in India, how many cases seek surgical help at once? Very few indeed. From ignorance or fear of hospitalization, and may be because of undue confidence in the barber midwife, the patient more often seeks the latter's help. This crude woman anoints and massages the abdomen so roughly that the whole abdomen becomes tender. Should the patient survive such treatment, the pain becomes so great that she is forced to seek medical aid. To elicit a true history in such a case is often very difficult, and to get her consent to an operation is even more so. There are exceptions, no doubt, but this is the usual kind of case that seeks admission at the King Edward Memorial Hospital, Secunderabad."

Over 6 years have elapsed since the above was written. Is there any improvement for the better amongst the public in general? The answer is—no. The barber midwife still holds the place of pride. Instead of teaching the ancient history of Rome and Greece in our schools and colleges if simple hygiene and how to tackle the common ailments are included in the curricula, perhaps these would help the Nation better.

In many cases of ectopic gestation the patient gives a history of missing a period or two, but there are also cases where a history of amenorrhœa is not obtained. The one constant feature in all cases of ectopic gestation is pain and tenderness in the abodmen. Whereas in intra-uterine pregnancy there is only slight pain and much bleeding p.v., in ectopic pregnancy there is much more of pain and less of bleeding. Sometimes the bleeding in ectopic pregnancy is prolonged and the pain is of a colicky nature. If an ectopic gestation ruptures and a large quantity of blood is discharged rapidly into the peritoneal cavity the patient will have all the signs and symptoms of shock and collapse. On the other hand if the rupture or tubal abortion is gradual, the symptoms are usually not so acute. During vaginal examination movements of the cervix causes pain and tenderness is felt in all the fornices. A soft mass may be felt in one of the fornices which may or may not be pulsatile. When in doubt aspiration of fresh or dark-coloured blood from the pouch of

Douglas, with an exploratory needle, will very often confirm the diagnosis, but in very rare instances it may mislead, for it might turn out to be a chocolate cyst of the ovary, as mentioned in the article "Mistaken diagnosis" published in the *Indian Medical Gazette*, April—May, 1946 by T. D. Rajoo.

During the last 3 years 1946 to 1948, 40 cases were operated on for ectopic gestation with only one death. In 16 cases the age of the last child ranged from 3 years to 11 years. There were 11 nullipara of whom 6 had regular periods. Blood pressure was low in many cases. In 3 cases blood pressure could not be recorded on admission, and yet, after a few hours of rest they stood the operation well. No saline or blood transfusion was given before the operation, but only during and after the operation. 20 cases had auto-blood transfusion; 3 cases as much as 2 pints each.

As regards anæsthesia serious cases were done under local anæsthesia with a few whiffs of chloroform. Operation should always be undertaken however serious the condition may be, so far as ectopic gestation is concerned.

Acknowledgment—I am grateful to my Chief, Dr. L. D. Khatri, L.R.C.P., M.R.C.S. (ENG.), D.T.M., D.P.H. (LOND.), F.R.F.P. & S. (GLAS.), for allowing me to publish this article.

(*Continued from page 136*)

broader than required. It has to be narrowed in width by sawing through and a thin slice is also removed along the opposite border in order to create a rough surface for union and new bone formation which is the main aim of the operation. This rib-graft nicely approximates to the kyphotic curve of the spine. It is held by chromic catgut sutures. The fascial flap is drawn over it and sutured. The semicircular skin incision by the side of the spines is closed with a small rubber drain and dressing applied. The patient lies on his back on a thick mattress with a thick wool pad over the operation site. The skin toilet is very important to prevent bed sores. The patients make good recovery. They are required to lie in the posterior plaster cast for about 3 months. The plaster cast is prepared before operation. The further use of plaster cast depends on individual progress. In some cases they require it for a few months more but usually they do not. Then they should only use spine jacket. It is beyond the scope of this article to describe the various techniques of operations mentioned here. The readers are requested to refer to any of the standard books on operative surgery.

SPECIAL ARTICLE

BEHAVIOUR OF MUSCLES OF THE GRAVID UTERUS: A SURVEY*

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The growth of the uterus and its development during pregnancy, its behaviour during parturition, and its involution during puerperium have always seemed a marvel to an obstetrician. The musculature shows enormous potentiality and adaptability and yet some unexpected whims at times. It does its job, and does it well, but will tolerate neither any interference nor neglect from the parent body or any extraneous factors.

In the progravid state changes are predominantly the endometrium—the epithelium, the glands, the stroma and the vascularity. It is a hormonal response.

With the beginning of conception there is massive and rapid hypertrophy and hyperplasia of the uterine musculature, out of all proportion to the growing ovum. The uterus at this stage grows mostly as a potential organ, and not by the expansion of the growing ovum. This is also a hormonal response.

The nulliparous uterus measures 6 cm. × 4 cm. × 2 cm. and weighs 42 gms. Its wall is 8 mm. in thickness. The thickness reaches 25 mm. at 4th month. At the end of pregnancy it varies from 4 to 10 mm. The capacity increases from 2 c.c. to 4000/5000 c.c. at term, and the weight of a full-term uterus measures about a pound and a half. The muscle fibres in nulliparous uterus are 50 μ in length. The length goes up to 200 μ to 600 μ at term.

The three layers of the uterine muscle become evident mainly in the gravid state, and are arranged in a complicated net-work. Fibroelastic tissue becomes soft, elongated and fibrillated helping free movement between layers and bundles of muscles. These conditions permit and help the uterus to distend and accommodate the growing ovum.

CERVIX

The changes in the cervix are also similar but in a miniature scale. Due to increased vascularity (both hæmic and lymphic) there is softening of the cervix. The softening starts at the lips and proceeds upwards and from without inwards. The isthmus extending from the anatomical os to the histological os increases from 2 to 3 times in length during the first 3 months and later unfolds and is included into the general uterine cavity. The isthmus which measures below 1 cm in the non-gravid state may become 7 to 10 cm. at term.

The isthmus or the potential lower uterine segment has the anatomical internal os of Aschoff as its upper boundary. This is the junction of the cervical canal and the uterine cavity proper, and is the area of physiological retraction ring. The lower limit of the isthmus is the obstetrical internal os. This is the

*Read at the South Calcutta Doctors Club on 17-9-50.

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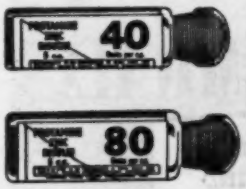

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junction where the fibrous tissue preponderance of the cervix changes to muscle tissue preponderance. It corresponds almost to the histological internal os which is the junction of the change of epithelium. Though the separate entity of the isthmus anatomically, biochemically, and physiologically has been disputed, the clinical importance of this portion of the cervix cannot be ignored. Danforth and Chapman in later studies admit with reluctance the integrity of the isthmic segment and the corpus as a functional unit, and on the basis of their studies on the mucous covering of the isthmic portion of both non-pregnant and pregnant uterii deny the specific entity of this portion. So Aschoff's isthmus of 1905 is no more after its long years of survival. According to Fitzgerald this potential lower uterine segment or the muscular portion of the cervix has a definite sphincteric action and a mechanism of retention of the gestation until its full dilatation when there is the withdrawal of the sphincteric action and the gestation drops down into the pelvic cavity. The dilatation of the cervix takes place in the following order:—

Anatomical os, elongation and unfolding of the isthmus forming the lower uterine segment, obstetrical os followed or preceded by the external os. The gestation will be retained till the complete withdrawal of the sphincter, the last yielding portion being the obstetrical os even if the external os had completely opened up. Normally, this process is slow and gradual.

Corpus

The uterus grows from 1½ oz. to 1½ lb. at term. The shape of the uterus soon after implantation changes anteroposteriorly and after 2nd month also laterally, till at the 3rd month, the uterus is spherical. According to Reynolds it remains spherical and the intra-uterine tension is three-dimensional during this period of active uterine growth. A time comes when this three-dimensional tension comes to a head producing a temporary ischæmia of the uterus a period of crisis. Soon there is a change in the shape of the uterus from the spherical to cylindrical. The three-dimensional tension is released to a more or less one-dimensional *i.e.*, longitudinal tension alone and the return of the normal uterine blood flow. Reynolds calls it "conversion". Before conversion, the uterus has reached the almost maximum growth and along with it attained the potential contractile power. The walls have grown from 8 mm. to 25 mm. in thickness. After conversion, the uterus ceases to have active growth but the fœtus continues to grow and grow rapidly. The uterus acts thereafter as a passive organ allowing distension or stretching to accommodate the conceptus till term when the uterus refuses to be stretched any more, and starts contracting by the potential power it has attained during the period of rapid uterine growth before conversion. The result is the dilatation of the cervix, withdrawal of the sphincteric action or retention mechanism, and ultimately expulsion of the conceptus. The walls of the uterus due to stretching have been reduced from 25 mm. to 4 to 10 mm. in thickness. Thus, the uterine growth and accommodation pass through 3 stages:—

In the beginning, the uterus which is originally a pear-shaped orgap grows out of proportion to the growing ovum and the intrauterine tension is just gaining strength. The second stage is the stage of all-dimensional intrauterine tension reaching gradually to a head, and the shape of the uterus is spherical. The 3rd stage is reached after conversion, the shape becomes cylindrical and the intrauterine tension is mainly along the length of the uterus. The first two are the stages of rapid uterine hyperplasia and hypertrophy. The 3rd stage is the stage of uterine stretching and rapid fœtal growth. The growth of the uterus is comparatively negligible in this stage.

The conversion occurs at a specific period of gestation in each specific litter-bearing species, and involves firstly a decline in the uterine growth, secondly, a change in the shape of the uterus and thirdly, the beginning of the rapid fœtal growth. The period is almost transient, the tense uterus suddenly becomes soft and flaccid but this slack is soon taken up by the growing fœtus and the uterus is firm again.

By repeated soft tissue x-ray examination of the abdomen, an attempt has been made to find out the actual time of conversion in human subjects, and according to Gillespie it is definitely after the 20th week. Following conversion, the uterine stretching goes on rapidly till the 32nd week after which there is a decline in the rate of elongation associated with general ischæmia of the uterus till the onset of labour. In an illustrative graph Gillespie has shown a comparative picture of the weights of the uterus and fœtus and the thickness of the uterine wall throughout gestation from the materials available.

This mode of uterine hyperplasia, hypertrophy and conversion with the development of the potential and highly contractile power whatever may be the source of the new myometrium (the fibroblasts, the special form of histiocytes or the pre-existing muscle cells) together with the sphincteric action and retention mechanism of the muscular portion of the cervix, play just as important a part in the growth, maintenance and ultimate ejection or expulsion of the conceptus, as in producing several probable anomalies throughout gestation and labour.

Clinical Aspect

A. *Sphincteric withdrawal in the cervix and its clinical implications*—I. When the withdrawal is sudden precipitate labour is the result.

I. Constriction rings (myogenic or neurogenic) which are expressions of a hyper-irritable uterus in any of the 3 stages of labour involves partially or totally the circular fibres alone. The lower uterine segment having an abundance of circular fibres with sphincteric action should naturally be the site of the highest incidence of these spasms in the complete form, whereas the rings in the upper uterine segments ought to be mostly incomplete and oblique instead of circular considering the disposition of muscle fibres. The ring-in-front cases which involve the external os cannot fall under this category, the external os having practically no muscle element the pathology must be different.

III. Then again is the factor of artificial rupture of membrane to hasten engagement and labour. A correct estimation of this withdrawal of the sphincteric action would only give us the clue about the time when it could be profitably done. An error of judgment would only produce the difficult problem of curtain cervix often with œdema due to failure of the dropping down of the presenting head.

IV. Lastly the early interruptions in cases of high amputation of cervix: could they be due to the removal of a portion of the muscular cervix thereby interfering with the retention mechanism?

B. *Conversion and its clinical possibilities*—Of all the phases of uterine growth and accommodation the "Conversion" has appealed to the writer most. It is really a crisis with a double edge. It is a crisis because unless there is conversion the growing fœtus finds no accommodation. It is also a crisis because the conversion involves the following critical stages.

(*a*) A pre-conversion ischæmia due to the intra-uterine tension coming to a head.

(*b*) A complete change in the configuration of the uterus within a presumably short period.

(*c*) Sudden release and diversion of the intra-uterine tension and

(*d*) Post-conversion rapid stretching of the uterine musculature which has already developed a highly contractile power.

These factors might produce any disturbance in the continuance of the growth or certain other complications later on.

I. Abortions—The incidence of abortions at different stages of pregnancy is not properly known. We know some of the fœtal, maternal and paternal causes, Question arises whether this conversion plays an important maternal cause. Could this high intra-uterine tension and the ischæmia produce the death of the fœtus? Could this sudden alteration in the configuration and the sudden release of tension produce separation of the placenta and abortion, or could the uterus become prematurely irritable immediately at the onset of stretching and expel the conceptus? If we assume these possibilities, there would have been a high incidence of abortions near about the conversion, whereas experience and available data show that the incidence before conversion is considerably higher, but then there are so many other ætiological factors of abortions. Could it be that the process of conversion starts much earlier? The actual duration of conversion period is not known. It has been assumed that it is transient. By x-ray Gillespie considers it to be definitely after the 20th week. Unfortunately there are no clinical signs to detect the change except a tense uterus suddenly becoming soft and flabby as Reynolds suggests or possibly the change of direction and situation of the round ligaments if they can be felt so early in pregnancy or there may be if noticed, a change in the rhythm of the uterine souffle. Strangely enough the woman herself is completely unaware of this change. Though Gillespie found no ill effects by repeated x-ray examinations starting from the 18th week, the method is still not free from danger to the fœtus. Repeated bimanual palpation of a pregnant uterus is also not practised, and even then we might just miss the bus. If we presume that the process starts much earlier than is detected by x-ray and culminates in actual conversion at about the 20th week certain interruptions of pregnancy in earlier weeks may also be explained by this process of conversion. At least it is probable that just as pathological ova play a big role in causing early abortions, conversion might play a similar role in late abortions.

II. Abruptio Placenta and Toxaemia—If due to sudden release of intrauterine tension and change in the configuration of the uterus during conversion the placenta has not been completely detached leading to abortion, a partial separation of varying degree might result. Retroplacental hæmorrhage from a small collection to a condition of utero-placental apoplexy may be the outcome. Associated signs and symptoms of toxæmia are usually but not always there. But it has been noted generally that the bigger the damage more marked the signs of toxæmia are. Here again, could we assume that the toxæmia is the effect and not the cause of the separation? Could it be that toxic foreign proteins are liberated from the damaged area of the placenta and thrown into the circulation producing all the various types of toxæmias of late pregnancies including exlampsia? (Young) If we accept the possibility, the conversion could be considered as an important predisposing factor in the ætiology of toxæmia. It should also be taken for granted that conversion does not as a rule produce placental separation, and even if there is separation, production of toxic matters may not be constant or there might be neutralisation by the body of these toxic products. The administration of antihistaminic drugs for toxæmias has lately been significantly advocated. Gillespie suggests that the ischæmia of later months may be a causative factor of toxæmia.

III. If the actual time of conversion could be determined maturity of the child, and for that matter, the diagnosis of post-maturity could be assessed with greater accuracy than when done by calculating the conception-delivery or insemination-delivery intervals.

C. *Stretching and its clinical aspect*—I. Premature Labour—Uterus develops its contractile power but allows it to be stretched upto a certain period before it uses this power. The rule having always some exceptions, there will be uterii, which will reach the stretch limit much earlier resulting in premature labour. The uterus which has a deficient musculature or which is irritable will not accommodate the conceptus till term. Stretch limit of a given uterus is thus an important factor for the maturity of the fœtus.

II. Hydramnios Twin—Here again premature labour is the rule due to the uterus reaching its "stretch" limit earlier.

III. Stretch Limit—A normal uterus of a normal subject has a potential "stretch limit" to accommodate a conceptus upto about 40 weeks and a gravid uterus during the period of hypertrophy develops also a potential but powerful contractile power. Could we then assume that the primary factor which would produce the first contraction at term is the uterine musculature itself with the inherent qualities within it, the

stretch limit and the contractile power? Could the start of uterine contractions be just mainly due to a mechanical cause, the endocrines, and such other factors being concommitant?

IV. Why then is the failure of contraction of the uterus after the stretch limit is reached in cases of post-maturity? Could it be that in those particular uterii the stretch limit is extended after the 40th week? After all, in hydraminios and twins cases they do go beyond the stretch limit in most cases; or may be these are cases of simple inertia going on for days till the uterii awake and gain their power of contraction. Once the first contraction is there it will initiate the 2nd, the 3rd and so on.

V. What again are these painless contractions of the uterus more or less throughout pregnancy known at the Braxton Hicks contractions? Are they miniature half-hearted expressions of the contractile power of the uterus not concomittant with simultaneous opening up of the cervix, thus explaining its painless character? They involve contractions of the whole uterus with gradations of intensity diminishing from above downwards. Have they any correlations with the actual labour pain? Do they change their pattern and start the contractions of the upper with relaxation of the lower portion of the uterus producing labour?

Summary

The behaviour of the uterine muscles in the gravid state has been reviewed.

Clinical aspects as regards the sphincteric action of the isthmus, the conversion of the uterus and the post-conversion stretching have been discussed.

Comments

I. The purpose of this paper is not to minimise or ignore the very important functions of endocrines in the different phases of pregnancy and labour.

II. The author's contention is that the mechanical part, played by the musculature in the normal growth, maintenance and ultimate expulsion of the conceptus, has not been given the importance it deserves. The initiator is important but the initiated is no less important.

III. The author also suggests the probable association of this normal behaviour of the musculature with the production of certain pathological conditions *e.g.*, abortions, abruptio placenta and toxæmias, prematurity and postmaturity and constriction ring dystocias.

IV. Further studies on "conversion" and its actual time of happening would enable us to assess correctly the maturity of the fœtus.

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CASE NOTE

A CASE OF HUGE PUTRID LUNG ABSCESS TREATED WITH PENICILLIN

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Penicillin therapy in lung abscess is a well-established procedure now, and many cases are in record where penicillin therapy alone has cured an abscess otherwise unsuitable for conservative medical treatment. In the case reported below a huge lung abscess involving nearly the whole of the left lung, completely healed up with penicillin therapy in such a short period that it was thought worth reporting.

Case Report

History—M. C., aged 40 years, came to us on 2-11-49 for fever, cough and profuse expectoration. About a month prior to this he felt slight pain in the left side of the back along the paravertebral region accompanying with dry ineffective cough, lassitude and fatigue. The pain gradually spread in front and back and increased in intensity. After about three weeks he had an influenzal attack of fever (101°F.) with pain all over the body. That fever continued for 3 days and after about 5 days' remission, he had another bout of fever on 2-11-49 when he coughed out about 2 pints of foul-smelling chocolate-coloured material with pus and clots of blood (no frank blood). At this stage he came under our observation. There was no significant past history of illness except that he used to suffer from boils and furuncles too often and about one month prior to the beginning of this attack he had boils all over the body.

On examination—Patient was well-nourished but otherwise looked very toxic and exhausted. He was cold and clammy and had difficulty in breathing with distressing hiccough. There were signs of cavitation in the left side of the back by the side of the scapula and also presence of diffuse rales in the left side, more audible from the back. Temperature—101°F., pulse—140 per min.; respiration 40 per min. Other clinical examinations revealed nothing significant.

Laboratory findings—Blood: W.B.C.—10,000 per c.mm.; Neutrophils—84 per cent; Lymphocytes—12 per cent; Monocytes—4 per cent; Eosinophils—nil. No malaria parasite found.

Sputum: No A.F.B. No amœba. No lung tissue or fibrous tissue. Plenty of pus cells. R.B.C.s and Gram-positive cocci in clusters and chains.

Urine; Nothing abnormal.

Stool: Nothing abnormal.

X-Ray: A portable skiagram was taken on the following day and showed a big thick-walled cavity in the left lung covering the entire area from the lower border of the second rib upto the dome of the diaphragm. The upper two-thirds of it contained gas and the bottom, some liquid. There was some congestion in the right lung. The findings suggested an unusually large lung abscess with a distinct fluid level, and presumably communicating with a bronchus (FIGS. IA and IB, Plate IV).

Progress of the case—The result of operative treatment in lung abscess cases is occasionally fraught with danger even now-a-days. Moreover, the patient was too ill for any drastic measure. Accordingly, we preferred the conservative line of treatment along with penicillin therapy, both systemically and by inhalation. He was put on procaine penicillin 300,000 units twice a day for the first 5 days and then once a day for subsequent 12 days (2-11-49 to 19-11-49). During this period he was asked to inhale penicillin from the dispolator (Squibb) frequently and many times a day, and he used 15 of them. He was also given usual supportive treatment like expectorant mixture, glucose injections and plenty of glucose water to drink, vitamins, etc. Postural drainage was encouraged at the same time. Patient was asked to lie down at one end of his bed on his right side with a pillow under the loin and then hang down his head as far as possible towards the flood, with his hand supporting on the floor. He had to stay in this posture for 15-30 minutes twice a day. Moreover, whenever he used to lie down on his right side, expectoration was easy and plentiful. Patient used to bring out profuse expectoration (average about 15 ozs. to 1 pint a day) for the subsequent 10-12 days and gradually the quantity became smaller and sputum less offensive. Fever subsided after 4 days of penicillin therapy. For the first few days he used to get frequent hiccough which was relieved after a bout of good expectoration each time. Recovery was otherwise uneventful. On 3-12-49 another skiagram was taken and it showed no longer the huge thick-walled cavity on the left side of the heart. There was a diffuse opacity extending from the anterior end of the fourth to the seventh rib. A thickened transverse band of fibrous tissue could be seen extending from the hilum to the periphery. The cavity had disappeared and was replaced by fibrous tissue. There was some thickening of pleura adjoining the area occupied by the cavity (FIG. 2, Plate IV).

Patient is under observation for the last nine months and he is free from all symptoms. Another radiological examination of the chest on 22-7-50 revealed practically no abnormality in the lung fields (FIG. 3, Plate IV).

DISCUSSION

The actual ætiological factor giving rise to such a huge lung abscess is rather obscure in this case. The nature of the sputum was peculiar. It was more like the chocolate-coloured sputum of liver abscess bursting into the lung than that of putrid lung abscess. In fact, we searched for amœbæ in the sputum. The colour was due to the associated hæmorrhage in the abscess cavity. The altered blood mixed with pus looked like chocolate-coloured liver abscess 'anchovy sauce' pus.

In putrid lung abscess the line of treatment has been completely changed with the advent of penicillin therapy. Sulfa drugs are useless and surgical intervention is generally necessary in cases of chronic and big abscess cavities. But in acute abscess and in cases with free drainage, penicillin gives excellent results.

In the present case when we saw him first, the abscess was rather subacute or chronic as evident from radiological findings. Judging by the huge dimension and chronicity of the abscess cavity, surgical treatment might have been imperative had it not so quickly responded to penicillin. However, such dramatic result from penicillin therapy was only possible in the presence of an excellent drainage. There was practically no residual radiological signs in the skiagram taken 15 days after the completion of the penicillin course. It seems that however big big the abscess cavity might be, even in a chronic case penicillin should be given a chance before any surgical procedure is contemplated, specially bearing in mind the possibilities of the accompanying dangers of surgical treatment.

SUMMARY

In a case of huge lung abscess occupying nearly the whole of the left lung which looked like a subacute or chronic case radiologically, procaine penicillin 300,000 units daily for 17 days and penicillin inhalation from dispolator were given with excellent results. Skiagram taken 15 days after completion of the penicillin course showed complete healing of the cavity. Such remarkable response with penicillin in so big a chronic cavity was only possible in presence of a good bronchial drainage. It is suggested that penicillin should be given a trial in all types of putrid lung abscess before any surgical treatment is contemplated.

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INFECTIVE HEPATITIS AND HEPATIC COMA

The yellow atrophy of the liver or hepatic coma is admittedly a grave condition. With the advancement of knowledge in its etiology, fresh hopes for its prevention has been raised, and a discussion on the subject is timely. We publish at another place in this issue an article by Chatterjee and others[1] on the subject. Hepatic coma is but a terminal event and may be the end picture of all liver diseases but the most important point that has recently been brought out by many observers including Chatterjee, is that hepatic coma may follow even the most common and apparently mild liver disease, *viz.*, infective hepatitis. That massive hepatic necrosis with hepatic coma may follow infective hepatitis was first pointed out by Cockayne[2] in 1912, and it has been shown that incidence of hepatic coma increases when infective hepatitis is epidemic. Snavely[3] after reviewing the literature on the subject opines that "it seems reasonable to believe that with either naturally transmitted or the syringe-borne disease, one may expect a fatality rate of about 0·2 per cent". Infective hepatitis is a mild disease with an average duration of about one month and a half though the duration may be prolonged to four months. In some cases "the icteric events take a turn from the usual benign course for the worse." Jaundice increases in intensity and acute hepatic failure ensues (Lichtman[4])." Hence any unusual prolongation of the icteric stage should put one on guard and an investigation if there is any massive necrosis developing in the liver, is essential. It is important to know whether there is any means of early recognition of the condition and whether there is any method by which we can deal with it effectively. To quote Snavely again, the rate of incidence of coma is increased in "advanced age, the gravid state, malnutrition, presence of or recent recovery from wounds, burns, serious illnesses, and major surgical procedures."

Cockayne (*loc. cit.*) has shown that the prognosis is much influenced by pregnancy. Recently it has been shown by workers in Europe and South Africa, that "if infective hepatitis is prevalent in famines and among malnourished persons", massive hepatic necrosis becomes common (Himsworth[5]). The same is true in cases of injury; in injured persons the incidence of hepatic coma is 20 per cent, while in the control series it is 0·2 per cent.[6] In our country, one is frequently confronted with malnutrition due to starvation, and devitalisation due to chronic illnesses, *e.g.*, malaria, kala-azar and other tropical diseases. On top of this a large section of our people suffer from chronic intestinal infections—protozoal or bacterial, which further lower their nutritional state. If any one with such poor health gets an attack of infective hepatitis, he may easily fall a prey to hepatic coma, unless extreme care is taken for his treatment, as when a search for the basic factor common in these diverse conditions is made it seems that Himsworth[7] has struck the right note on the pathogenesis of the condition when he said that "in each case there are indications of interference with nutrition" and "the course of events in these cases depends upon three factors: the amount of essential nutriments circulating in the blood, the degree of circulatory restrictions within the liver, and the duration of that restriction."

Therapeutically very little can be done to deal with the last two factors mentioned above leaving at our disposal only the first factor, *e.g.*, the supply of nutriment which can be tackled effectively.

Latner[8] recently reported a series of cases of severe liver diseases treated mainly on nutritional principles with 10 per cent dextrose solution with vitamins of the B complex group, plasma infusion, tocopherol and penicillin with happy results. These results are so impressive that one cannot but view the work of Gertzen[9] who concluded from observations in three parallel series of 97, 56 and 54 cases of acute epidemic hepatitis that "A considerable measure of freedom can be observed in the composition of the diet as an excessive increase of protein, fat or carbohydrate has no effect on the course of the illness." An Editorial[10] has rightly pointed out in discussing the above findings that if "the mechanism of the development of massive necrosis in infective hepatitis is as suggested by Himsworth and Glynn, methionine is particularly indicated in infective hepatitis not to shorten the clinical course but as a prophylactic against the development of acute yellow atrophy."

Recent study again points out that hospitalisation and bed rest markedly shorten the period of convalescence and rest forms one of the most useful prophylactic measures in the prevention of hepatic coma, so much so that Witts[11] opined, that there is a general

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[2] Cockayne, A. E.—*Quart. J. Med.*, **6**:1, 1912.

[3] Snavely, J. B.—*Am. J. M. Sci.*, **219**:89, 1950.

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[5] Himsworth, H. P.—Lectures on the Liver and its diseases, Blackwell Scientific publication, Oxford, 1947, p. 111.

[6] Woon, D. A.—*Arch. Path.*, **41**:345, 1946.

[7] Himsworth, H. P.—Lectures on the Liver and its diseases, Blackwell, Oxford, 1947, p. 112.

[8] Latner, A. L.—*Brit. M. J.*, **2**:748, 1950.

Gertzen, O.—*Ibid.*, **1**:1184, 1950.

[10] Editorial—*Brit. M. J.*, **1**:1184, 1950.

[11] Witts, L. J.—*Brit. M. J.*, **1**:46, 1947.

impression that strict bed rest is more important than strict diet. But how few medical men think of jaundice as an indication for bed rest!

With rest and nutriment we must also evaluate the role of antibiotics in the prevention or treatment of hepatic coma. Latner (*loc. cit.*) used penicillin, Krishna Rao[12] has used streptomycin and now a report by Farquhar *et al*[13] shows that aureomycin has got a definite place in the treatment of acute hepatic coma in addition to supportive therapy. They saved four consecutive patients of hepatic coma with the exhibition of aureomycin.

Rest, diet and antibiotics, therefore, are the essentials in treatment and prevention of hepatic coma.

LAKE MEDICAL COLLEGE

We are sorry to learn that the Government of India have decided to close down the Lake Medical College of Calcutta from 1952 and in pursuance of this decision of the Government there had been no admission of students to this college during 1950.

This college was started in the premises of the American Hospital built upon the Lakes, Calcutta, during the last great war. As a teaching institution it was meant mainly for the medical licentiates who served in the war as Commissioned I.A.M.C. officers and who were getting here facilities to obtain the condensed M.B.B.S. course within 18 to 24 months. Every six months 150 such candidates were being admitted from different provinces of India. Lately its door was thrown open to the civil practitioners also. The medical licentiates thus had in it an institution exclusively reserved for their higher education.

The decision to close down such a useful institution has naturally been received with grave concern by the medical profession which has been trying all these years to have a uniform system of medical education for all and was enthused for a time to find the Lake Medical College helping at least 300 medical licentiates every year to get the facilities for undergoing the M.B.B.S. course. Dr. Chamanlal Mehta as President of the Indian Medical Association very ably represented the sentiments of the profession and the views of the Indian Medical Association by writing to the Hon'ble Health Minister of the Government of India to allow the continuance of such a useful institution. We endorse every word of Dr. Mehta. It is really a pity that without making any alternative arrangements for the training of such a large body of aspiring medical men who were taking the fullest advantage of the facilities offered to them at the Lake Medical College, this is being closed down. We would even at this stage urge upon the Government of India and the Government of the State of West Bengal to pool their resources and agree to run this institution for at least a few more years so that a larger number of medical licentiates could benefit out of this institution. We do not look upon the decision as unalterable. The continuance of the college will surely help these aspirant doctors whose number even to-day is several thousand; on the other hand, its closure will definitely deprive the expanded city of Calcutta from the benefit of a very useful hospital. May we, therefore, appeal to the Government once again to look at the Lake Medical College from a realistic point of view and revise their decision to close it down.

[12] KRISHNA RAO, P.—*Indian M. Gaz.*, **85**:150, 1950.

[13] FARQUHAR, J. D., STOKES, JR. J., WHITLOCK, C. M., BLUEMLE JR. L. W., GAMBESCI., J. M.—*Am. J. M. Sci.*, **220**:166, 1950.

SRI AUROBINDO

The country plunged deeply into mourning when on the 5th December, 1950, Sri Aurobindo passed away. A great classical scholar and poet, Aurobindo was also a great political leader in the early phase of our national struggle for freedom. But there was always in him a spiritual urge for a higher and nobler life which gave him no rest.

Even during the days of Bengal Partition when he was a leading star in our political firmament, Aurobindo combined the impulse of a Karmayogin with the wisdom of a Jnanayogin and insisted on the four-fold constructive programme of Self-Government, National Education, Swadeshi and Boycott of Foreign Goods. In 1907 when *Bandemataram* started its publication as the mouth-piece of new nationalism, Sri Aurobindo became its guiding force.

He was arrested in 1908 in connection with the Alipore Bomb Case in which the young Barrister-at-Law C. R. Das came into political limelight. As an undertrial prisoner living in a secluded cell in the Alipore Central Jail he underwent a great spiritual transformation. Soon after his release he began to edit the English journal *Karma Yogin* and the Bengali weekly *Dharma*. In 1910 he left politics and retired from all worldly activities into his life of seclusion at Pondicherry devoting himself to meditation.

Here Sri Aurobindo wrote his *magnum opus* *'Life Divine'*.

To rescue this soulless civilization from the rut of despair and depravity, to lift man from the 'bottomless pit' of perdition to an elevated, divine life was his *sadhana* and in this he was the great golden link between the East and the West. Like Buddha and Christ his life on earth was a divine mission and the world will remember Sri Aurobindo as one of the greatest healers of mankind.

SARDAR VALLABHBHAI PATEL

One of the leading architects of new India and at the same time a firm pillar of the free State, Sardar Vallabhbhai Patel breathed his last on the 15th December, 1950, at the age of 75. The doughty leader of Bardoli, Sardar Patel, earned an undying reputation as the builder, unifier and consolidator of the Indian State.

With Gandhiji's blessing he piloted our national struggle through odds and vicissitudes to its final victory. A fighter for freedom, a defier of lawless law, Sardar Patel also came to be known of late as the Iron Man in the Cabinet, the custodian of 'law and order' and the symbol of the country's stability and tradition.

In his early life Sardar Patel was a gifted barrister, and later, became a staunch follower of Mahatma Gandhi. The epic story of Bardoli and its leader is now a part of our national history. Subsequent events which led him to the helm of the State affairs are also universally known in this country. Sardar Patel was a worldly wise practical man and was never shy of blunt words that hit. During the years 1924-28 he was at the head of the Ahmedabad Municipality and, as Dr. Pattabhi Seetaramiya has described, "he extended the city, improved its sanitation, infused a spirit of patriotism amongst the primary school teachers and inspired a salutary sense of fear in the Municipal Commissioner and the Health Officer."

During the most crucial and trying years following the transfer of power to Indian hands when disruption and disorder threatened the very existence of the nation it was Sardar Patel's titanic self-confidence and grim determination that brought about a united and integrated India out of a welter of as many as 562 ulsters of 'princely states'.

It is true that the Sardar died in his hour of triumph, having accomplished a good part of the task which he took upon himself more than 30 years ago. But to us who regarded him as the symbol of sanity and sanitation—both inward and outward—of our great Indian nation, that consoling thought is of no avail. We pay our sincerest homage to the departed leader and extend our sympathy to his bereaved family.

GEORGE BERNARD SHAW

George Bernard Shaw is dead; the voice of Methuselah is mute for ever. The world's most dazzling talker—now immortal for his laughter and bounce, attack and irony, wisdom and paradox—has left the rostrum of life with a broken thigh only to confirm his own dictum: "Do not try to live for ever; you will not succeed."

G. B. S. was a professional exaggerator and, therefore, the world has simply forgotten his brilliant absurdities on vivisection, anæsthesia and vaccination. But the terrible truths that he uttered in exposing the vagaries of the English society of 1906 in his *Doctor's Dilemma* could not be laughed away so easily. During the performances of *Doctor's Dilemma* at the Court Theatre in 1907 when he was reproached for making "the artist a rascal, the journalist an illiterate incapable, and all the doctors 'angels'," he replied, "I did not go beyond the warrant of my own experience". This shows his profound sympathy and concern for the doctors who, as he lamented, were "hideously poor".

"We're not a profession; we're a conspiracy" said Doctor Ridgeon in *Doctor's Dilemma*. Those who remember only this and concludes that G. B. S. had no sympathy for the medical profession should carefully read the following passage in the famous preface to his *Doctor's Dilemma*:—

"It will be admitted that there is a pretty bad state of things. And the melodramatic instinct of the public, always demanding that every wrong shall have, not its remedy, but its villain to be hissed, will blame, not its own apathy, superstition and ignorance, but the depravity of the doctors. Nothing could be more unjust or mischievous. Doctors, if no better than other men, are certainly no worse."

The medical profession of the world could not expect a better tribute from a man whose supreme delight in life was satire.

XII ALL INDIA OPHTHALMIC CONFERENCE, CALCUTTA

The XIIth session of the All-India Ophthalmic Conference will be held at Calcutta on 1st, 2nd and 3rd March, 1951. Dr. H. N. Bose, M.B., C.M., Principal, R. G. Kar Medical College, Calcutta, has been elected as the Chairman of the Reception Committee.

The subject for the symposium will be Myopia. The Adenwalla oration of the Conference will be given by Dr. B. N. Bhaduri, Prof. of Ophthalmology, R. G. Kar Medical College, Calcutta, and President of the Ophthalmological Society of Bengal. The title of the paper will be "Ocular Changes in Eclampsia-like Conditions in Pregnant Rats."

Any registered medical practitioner interested in ophthalmology is eligible to be a member of the Reception Committee of the ensuing Conference on payment of Rs. 15/-. Practitioners who have qualified during the last five years, may enrol themselves as members of the Reception Committee on payment of Rs. 10/- per head. Payments may be made by crossed cheques or postal orders drawn in favour of the "Ophthalmological Society of Bengal", at the office of the Society at 67, Dharamtala Street, Calcutta 13. Any further particulars can be had from the Jt. Hony. Secretaries at the above address.

CURRENT TOPICS

THE CARRIAGE OF INVALIDS AIR

Kenneth G. Bergin, M.A., M.D., D.P.H., A.F.R.A.S., writes in *Medical World*, **72**:359, 1950:—

On increasingly frequent occasions nowadays medical practitioners are approached by their patients for advice as to whether or not they, their children, or relatives should travel by air. The journey concerned may only be a relatively short one, or it may be a long transcontinental one, transoceanic or/and the conscientious medical attendant will do well to pause before he answers such a question, because there are several factors which have to be taken into consideration under such circumstances.

Broadly speaking the factors concerned may be divided into two main groups; firstly the physiological and medical consideration involved taking into special consideration the patient himself, and any disability he may have, and secondly details of the flight involved, including the total distance covered, time taken, schedule, type of aircraft, average height flown, and sundry other items which will indirectly affect the answer that is given.

As the object of this article is to assist doctors in coming to a decision it is proposed to consider briefly the factors involved in actual flight, and secondly to consider the medical aspects involved. Air sickness will be dealt with as a separate subject. Limitations of space preclude more than a brief reference to the matters under discussion and interested readers should consult specialised publications for further details. A bibliography is provided for this purpose.

Flight Factors

The subjects which come under this heading may be conveniently divided into the following:—

(*i*) *The Itinerary*—The itinerary details it is helpful to know include flight time of the longest sector of the route, the nature of the countries through which the aircraft is passing, namely tropical, temperate or arctic; whether the main passage is over sea or land, sea passages being notably smoother than those over land; the nature and time of resting facilities enroute, and whether the aircraft is "night stopping" which will enable the passengers to have a full night's sleep on the ground, or merely landing to take on fuel, water and food before resuming flight. Lastly, the total journey time involved will be a guide as to how fatiguing the journey may be expected to be, although it must be remembered that a leisurely flight of relatively long duration (say seven days), stopping each night en route, may be much less tiring than a fast journey of three days with no appreciable stops.

This may appear a formidable list of details to be ascertained, but in practice the prospective passenger will be able to see most of them in an air transport companies' time table or prospectus and such other information as is required will be readily supplied on request by the airline concerned. As a general rule, the longer the flight, the greater the average height, and therefore the greater the problems involved. Thus, for short flights the height may be 2-5,000 feet, for continental flights 5-12,000 feet and for long transoceanic flights 25-35,000 feet. It is important to ascertain, if possible, the greatest "cabin" height that is likely to be reached on the route, as this may be a deciding factor in some cases particularly heart disease. The term "Cabin" height refers to pressurised aircraft only, and means the altitude-pressure in the cabin as opposed to that of the outside air. This is explained in the next paragraph.

(*ii*) *The Aircraft*—There are only two questions of real importance here—of which the first is fundamental, namely, is the aircraft "pressurised" or not? It is necessary here briefly to describe pressurisation, which is designed to eliminate, for crew and passengers, the disadvantage of lowered atmospheric pressure experienced at height. In pressurised aircraft, air is introduced into the cabin by means of a mechanically driven impeller so that a pre-arranged pressure is maintained inside the aircraft, irrespective of the pressure outside. Thus, if air is introduced at a pressure of approximately 5½ lbs. to the square inch, sea level conditions can be maintained in the cabin when the aircraft is at 13,000 feet and at 25,000 feet actual pressure the cabin pressure can be maintained at 8,500 feet. Under such conditions special oxygen supplies are unnecessary and problems, as a result of lowered pressure, do not arise. The majority of airlines to-day are equipped with pressurised aircraft for long journeys, or will be in the near future, as new types come into service. Secondly, if the aircraft is pressurised, it is necessary to find out whether oxygen is provided for passengers or emergencies. If this is available, a person with a poor circulation, or with a mild degree of anæmia, may be greatly assisted. It is not usual for aircraft engaged in short flights at moderate heights to have pressurised cabins.

(*iii*) *The Weather*—While the vagaries of the weather are well-known, it is possible to ascertain with some degree of accuracy expected weather conditions en route. Thus monsoon weather in India will invariably be bad, winter on the North Atlantic probably, but not necessarily, poor, North America in summer, good. It is thus possible to form a broad estimate of anticipated conditions on which advice to an elderly, frail or very sick patient can be based. Having ascertained these facts, each one can be considered separately and conjointly with the others in relation to the patient's specific condition. Thus, a flight to America in a large pressurised aircraft, for example, can be an extremely restful and uneventful experience, while one in an unpressurised aircraft over the Alps, where it is necessary to climb to avoid bad weather, or one in which the aircraft has to go through severe storms, can be very exhausting, particularly if air sickness occurs. In this connection it is thought necessary to comment on this particular aspect separately.

Air Sickness

The cause of this condition is thought to be partly psychological, partly vestibular, and in part to

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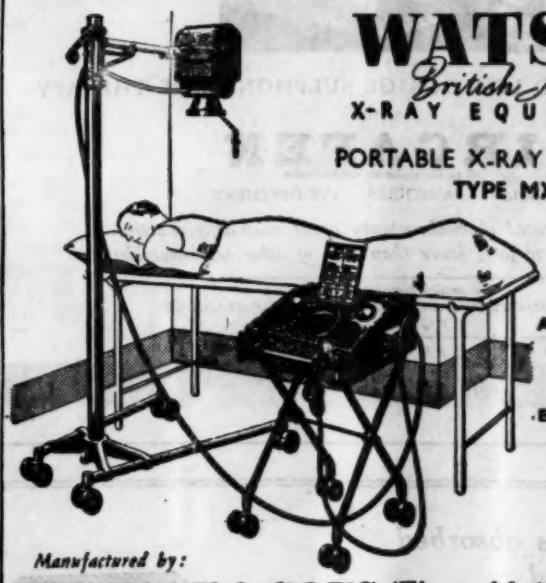

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be located in the cerebellar cortex; lines of treatment have been based on these assumptions.

Of all drugs experienced with, the one which stands out as being of proven value is hyoscine hydrobromide, and most remedies for motion sickness contain this drug, together with others in various combinations. One of the better of these combinations is hyoscine hydrobromide 1/200 gr. benzedrine sulphate 2 mgm. and sodium phenobarbitone 1/6 gr. but many other combinations claim to be equally effective. Dramamine is claimed by the Americans to be very efficacious, but further trials are required before an authoritative opinion can be expressed.

The belladonna alkaloids act on three sites; the nervous system, smooth muscle, and the secretory glands innervated by the postganglionic cholinergic fibres, on all of which they act as parasympathetic depressants. In addition to drug therapy, attention to such matters as elimination of odours, moderation in diet, and adequate oxygen, are all important; fixation of the head relative to the body is another important factor and considerably diminishes the liability to motion sickness. In audition, appropriate psychological care of passengers can measurably reduce the incidence in air travel. Some persons suffer from claustrophobia in aircraft, some do not like looking out of the window, particularly when a plane is turning, and some are affected by tobacco smoke, or cannot stand heat, and all such factors must be taken into consideration when endeavouring to make an assessment of the prevalence of the condition.

The incidence is not great in air travel to-day, owing to the fact that an increasing number of flights are at heights of 25,000 feet or more, where atmospheric conditions are smoother on the whole, and also because the advent of pressurised aircraft has led to better cabin conditions, particularly with regard to temperature, ventilation, and the elimination of odours.

Thus it is not an uncommon experience on a transatlantic flight for the entire passage to be without incident until the last fifteen minutes, when the aircraft is descending through the cloud from fine weather above, when rough conditions may be experienced and passengers may be sick. Many passsengers, as on trains and ships, bring their own favourite remedy, such as one of the many proprietary preparations on the market like 'Quells', 'White Wings', 'Vasano' or other well-known products, the majority of which contain hyoscine in varying amounts.

Medical Consideration

It is desirable, as well, to have a general guide as to the effect of flight on the more commonly experienced medical conditions, and therefore a broad outline is given under general headings to aid readers in this respect.

There are, of course, exceptions to every rule and each case will have to be judged on its merits. Furthermore, modifications to accepted practice will have to be made in the light of experience. If in doubt, practitioners would be wise to consult someone well versed in aviation medicine before making a decision.

I. Diseases of the Cardio-Vascular System —(*a*) Patients suffering from *uncompensated valvular disease of the heart* should not be accepted for air travel because the reduced oxygen supply to the tissues, already present, due to deficient circulation, will be still further accentuated at altitude, resulting in an earlier onset of anoxia.

(*b*) Patients with *well-compensated valvular disease* can, however, be accepted with caution, each case being considered on its merits, any doubtful cases being refused for the reasons mentioned above.

(*c*) Patients with *recent coronary thrombosis or angina pectoris* should not be accepted, as there is a liability of left ventricular failure when an increased demand is made on the circulation, to compensate for the reduced alveolar oxygen tension at height.

(*d*) *Hyperpiesis* should not be accepted if the systolic pressure is over 200 mgm.Hg. or the diastolic over 100 mm. Hg. because of the added demand on the cardio-vascular system at height, which might result in collapse.

II. Diseases of the Respiratory System—(*a*) *Asthma*—Severe cases should not be accepted for air travel due to the reduced pulmonary ventilating area which would result in an increased liability to anoxia. Moderate cases can be accepted and each one should be judged according to the efficiency of the pulmonary ventilating system.

(*b*) *Tuberculosis*—Patients suffering from active pulmonary tuberculosis should not be accepted under any circumstances due to the danger of hæmoptysis which is very likely to occur under conditions of reduced atmospheric pressure. There would appear to be no reason for the non-acceptance of healed or quiescent cases.

(*c*) *Pneumothorax*—Patients with therapeutic or spontaneous pnuemothorax should not be accepted for air travel for the folowing reasons:—

(*i*) There will be increased liability to anoxia due to the reduction in the pulmonary ventilating area.

(*ii*) Lowered atmospheric pressure will result in pericardial displacement away from the affected side. The changes in the size of a pneumothorax under conditions of reduced atmospheric pressure have been clearly demonstrated by x-ray examination.

(*iii*) There is added risk of hæmoptysis as in the case of active tuberculosis lesions.

(*d*) *Fibrosis of lungs*—Advanced cases of this sort, from whatever cause should not be accepted on account of increased liability to anoxia, due to the reduced pulmonary ventilating area.

(*e*) *Pneumonia*—Patients recuperating from a recent attack of pneumonia, or any form of consolidation of the lungs, should not, in general, be accepted, due to the greatly increased liability to anoxia, and also because of the added strain placed on the heart.

(*f*) *Bronchitis, bronchiectasis, etc.*—Such cases should not be carried in the acute stage because of the reduced ventilating area of the lngs; this consideration applies to any respiratory disease in which the cubic capacity of the alveoli is diminished.

III. Blood Diseases—Severe cases of anæmia and leukæmia should not be accepted on account of the reduced oxygen carrying capaciity of the blood, which will result in anæmic anoxia.

IV. Surgical Cases—(*a*) Acute surgical cases should not be accepted owing to the lack of adequate nursing facilities, and also because of the risk of a crisis en route. Such considerations would, of course, not apply in the case of a person who charters a private aircraft for his exclusive use and engages professional attention to accompany the patient, together with any special apparatus for oxygen supplies, blood transfusion or other equipment.

(*b*) *Convalescent surgical cases* stand air transport well, and can be carried if no special attention or nursing facilities are required.

(*c*) *Abdominal operations*—Recent abdominal operations involving laparotomy should not be accepted on account of the increase in volume of intestinal gases, which occurs with lowered atmospheric pressure. Flying under such conditions might result in the bursting of sutures internally, or in the abdominal wall. It should be remembered that in passenger-carrying aircraft, patients should not be accepted who might be objectionable to other occupants of the aircraft; thus a colostomy over which a patient had perfect control under normal conditions might become quite uncontrollable at height, which condition, objectionable at all times, would ve very much more so in the confined atmosphere of a passenger cabin.

V. Diseases of the Gastro-Intestinal System—(*a*) *Peptic ulcer (recent)*—Cases of acute ulceration, with or without perforation, should not be accepted on account of the risk of hæmatemesis.

(*b*) *Peptic ulcer (quiescent)*—Cases which are chronic and in which there is no history of perforation, or acute exacerbation, should not suffer any ill effects from air travel.

VI. Diseases of the Central Nervous System—There is no contra-indication to air travel in these cases except in the advanced stages, where special nursing is required, or the patient might be objectionable to other passengers.

VII. Diseases of the Endocrine System—*Hyperthyroidism*—Advanced cases of hyperthyroidism should not be accepted on account of the additional demands placed upon the cardio-vascular system.

VIII. Metabolic Diseases—Diabetics cannot maintain a correct insulin/glucose ratio in the blood when subjected to varying degrees of anoxia, and the susceptibility of such patients varies over a wide range. Severe cases should be warned of this disability and if the condition is not completely controlled, should not be allowed to travel. Cardio-vascular involvement is a contra-indication to air travel.

IX. Mental Diseases—Mentally deranged persons should not be carried on account of possible danger to themselves and to other persons in the aircraft.

X. Infectious Diseases—Such patients cannot be carried for obvious reasons.

XI. Specific Fevers—The advent of air travel has greatly complicated the problem of inter-national quarantine measures and carriage of such diseases. Thus, a person may be in an endemic yellow fever area one day and in a clear area the following day. This has raised international epidemiological problems, regulations for the control of which are periodically promulgated by the World Health Organisation to which most countries subscribe, and which correlates the preventive inoculation and vaccination measures to be taken by all travellers by air, as well as measures for the control of aircraft as carries of disease.

The Use of Drugs when Flying

(*i*) Sulphonamides—The use of sulphonamide compounds now in common use, such as sulphathiazole and sulphadiazine, are not contra-indicated for passengers transported by air, except for the possible gastro-intestinal upset from the drug which may be aggravated by motion sickness.

(*ii*) *Quinine*—The toxic effects of quinine, such as visual and auditory disturbances and the irritating effects, of quinacrine hydrochloride (atebrine) on the gastro-intestinal tract have not been found to be increased by high altitude.

(*iii*) *Morphine*—Observations on human beings, who have received morphine, have not revealed any serious respiratory depression when they were taken to high altitude. At present it would be wise to use morphine conservatively if there is much likelihood that the patient will be taken to altitudes of more than 12,000 feet, and if there are not adequate facilities for giving oxygen on the aircraft.

(*iv*) *Sedatives*—The central nervous system depressants most commonly used are the barbiturates, and drugs of this nature may be used without danger by passengers, but must not be used for aircrew, especially the pilot, any sedative being contra-indicated for aircrew for obvious reasons. Because of the sedative effect of benadryl hydrochloride and pyribenzamine hydrochloride on some persons, they should not be used initially by aircrew for a period of at least twelve hours before flight.

(*v*) *Streptomycin*—Streptomycin is also contra-indicated for the pilot unless there is urgent need for its use. The reason for this is that streptomycin may have a toxic effect on either the auditory or vestibular branch of the eighth nerve. If streptomycin must be used for a pilot, it should be used in such a way as to obviate the toxic complications as much as possible. If the dose is less than 1g. daily, there is not a great chance of damage to the eighth nerve. If it is necessary to give larger doses, complications must be avoided by giving small, divided doses more frequent-

ly and by not giving the drug for more than then days.

The Transport of Infants and Pregnant Women by Air.

(*i*) *Infants*—Experience has shown that on the whole, infants tolerate flying as well as or better than adults, but the mechanism of clearing the Eustachian tubes cannot be explained to children, and in order to achieve this clearance it is wise to feed them on descent from height when the act of swallowing should effect clearance. If not, the child will probably cry, when the same result will be achieved.

(*ii*) *Pregnancy*—There is no greater risk of precipitating labour in air travel than in other forms of transport, except in the roughest possible weather which is a risk that the passenger and public carrier must decide for themselves. Pregnant women are carried up to and including the eighth month of pregnancy on a majority of airlines to-day.

General Comments

In conclusion it should be stated that most of the considerations referred to in this article are concerned with flights over 10,000 feet where such atmospheric conditions begin to make themselves felt. The majority of long distance flying is done between 10,000 and 25,000 feet so as to obtain the advantage of consistent metrological conditions and higher operating efficiency for the aircraft. At heights of less than 10,000 feet many of the considerations referred to would not apply.

If an enquiry has to be made concerning the suitability of a patient for air travel it would be of great assistance to the doctor if the following details, at least, could be provided:—

Name, age and sex of patient; diagnosis; manifest symptoms; severity of disability (mild or severe); whether under treatment; whether treatment effectively controls symptoms; nature of treatment; whether an attendant is necessary; and other relevant details.

Briefly, the position may be summarised by saying that within the limits imposed by the aircraft and flight conditions, air travel is as comfortable and safe a method of transport as can be obtained, to which must be added the advantages to be gained by the immense saving of time owing to the speed with which a patient may be conveyed from the point of departure to his destination.

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NOTES AND NEWS

WORLD MEDICAL ASSOCIATION

The World Medical Association Fifth General Assembly meeting will take place in Stockholm, Sweden, in September, 1951. Owing to difficulty of accommodation, the Swedish Medical Association would like to have an estimate of the number of hotel rooms to be reserved for the delegates, not later than the 15th of January, 1951.

THIRD COMMONWEALTH MEDICAL CONFERENCE

The Third Commonwealth Medical Conference will be held in Johannesburg, South Africa, from 10th to 14th July, 1951.

EIGHTH TUBERCULOSIS CONFERENCE, HYDERABAD

The eighth conference of tuberculosis workers will be held under the auspices of the Tuberculosis Association of India in Hyderabad from 5th to 8th February, 1951. The Hon'ble Raikumari Amrit Kaur, India's Health Minister and President of the Association, will inaugurate the conference. Over 150 tuberculosis workers from different parts of India are expected to participate. Papers on subjects like mass radiography, tuberculin testing, research in tuberculosis, domiciliary treatment, and thoracoplasty will also be read.

THE BOMBAY OBSTETRIC AND GYNAECOLOGICAL SOCIETY

The 6th intensive Refresher Course in Obstetrics and Gynæcology will be arranged by the Bombay Obstetric and Gynæcological Society in the last week of February or first week of March, 1951.

A nominal fee of Rs. 15 each is to be paid in advance for registration of the names for the course. The visitors will have to make their own arrangements for boarding and lodging. Persons desirous of joining this Refresher Course are to contact Dr. B. N. Purandare or Dr. S. Antekar at Dr. Purandare Buildings, Chowpaty Sea Gate, Bombay-7.

FIFTH GUJARAT AND SAURASHTRA PROVINCIAL MEDICAL CONFERENCE, NADIAD

Under the auspices of Gujrat & Saurashtra Provincial Branch, I.M.A., the 5th Annual Conference of medical men of Gujarat & Saurashtra will be held at Nadiad during the last week of March, 1951. Along with the Conference there will an exhibition of surgical and medical appliances and pharmaceutical products. Subjects for Symposia are:—(1) Hypertension, (2) Acute abdomen (3) Obstetric emergencies in moffusil practice.

Further information can be had from Dr. B. B. Shelat, Mody-Santh, Nadidad (B.B.C.I.Rly.).

HELP FOR FLOOD-STRICKEN PEOPLE OF PUNJAB (I)

Dr. Chhabil Das, President of the Punjab State Branch of the Indian Medical Association has made the following personal appeal to the members of the I.M.A. for helping the flood-stricken people of Punjab (I):

I believe that you are well aware that the recent floods have, as elsewhere, played a havoc in our state. The worst affected districts are Gurdaspur, Amritsar, Ferozepur, Jullunder, Hoshiarpur and Ludhiana. Over three thousand villages have been inundated. About two lacs of houses have either fallen or been badly damaged affecting a population of over eighteen lacs. Vast areas of cultivable land have turned into lakes providing potent breeding grounds for mosquitoes. Supplies of drinking water have been dislocated in many villages and people have nothing else to use than all sorts of polluted water and are thus becoming prone to water-borne diseases like cholera, dysentery, typhoid and other intestinal infections. Malaria, which is already taking a heavy yearly toll in the state is likely to create hell in these flood-affected areas. The Government is fully alive to its duty and is doing everything possible to alleviate the sufferings of the people. Food depots are being opened in various villages; temporary shelters have been provided and taccavi loans are being granted to cultivators to purchase seeds and bullocks lost in the floods. The medical profession in general and the Indian Medical Association in particular, who claim to be the custodian of the health of the people, also have a duty towards them in this calamity. The Working Committee of the Punjab State Branch of the Indian Medical Association has, at its meeting held at Ludhiana on 22nd October, decided to place the services of the Association at the disposal of the Government. It has also decided to organise relief parties. The local branches in the state are, therefore, requested to enlist volunteers from amongst their members. When on relief work these parties will be provided with conveyances and the necessary medicines and they will also be paid their messing expenses. To meet these the Committee has decided to start a fund towards which every member should contribute at least Rs. 3 each. The money thus collected should be sent to the Hony. Treasurer Dr. A. R. Sud, Ambala City. I hope the members will rise to the occasion and offer help and service for the Punjab people in their distress.

ALL-INDIA LEPROSY WORKERS' CONFERENCE

The third annual session of the All-India Leprosy Workers' Conference was held in Madras City from October 3 to October 5. The Conference was inaugurated by Dr. Rajan, Health Minister, Madras Government and was presided over by Dr. E. Muir. Some important current problems relating to leprosy were discussed, and the following resolutions were passed:

1. Resolved that:
   - (*i*) The Hind Kusht Nivaran Sangh be requested to undertake the responsibility of initiating the All-India Leprosy Workers' Conference, every second year or as found convenient, in different parts of India with the help of one of its state branches which will undertake the responsibility of organisation.
   - (*ii*) The Sangh be requested to take steps to compile lists of leprologists and of those engaged in active social work in leprosy all over the country, which lists would be used, among other things, in making out invitation to these conferences.
   - (*iii*) The Sangh be requested to make arrangements in future conferences for the members of the All-India Leprologists Association to hold their scientific sessions.
2. Treatment with sulphones is recommended in all active and progressive cases of leprosy. It is further recommended that parenteral administration of sulphetrone—aqueous solution (50 per cent) in an average dose of 4 gm. per week is a safe medication. With reference to diaminodiphenyl sulphone (DDS) caution should be exercised in the administration of this drug, and the average oral dose should not exceed a total of 1 gm. per week and the daily dose not more than 200 mgs.
3. It is noted with gratification that the sulphone preparations are now being manufactured in India and the Central and State Governments are urged to give all facilities for speeding up production. It recommends that until adequate supplies are available locally, facilities for the import of necessary quantities should be granted.
4. The Conference recommends to the Gandhi Memorial Trust Fund and other philanthropic institutions that they should supply sulphone preparations to clinics and institutions, staffed with qualified and suitably trained medical personnel, for the more effective treatment of leprosy.
5. The Conference recommends that a recognised leprosy specialist be consulted when opinion is needed to decide whether a non-infectious case is capable of pursuing any particular employment.
6. In view of the increasing association of social workers with leprosy work, and in view of the fact that it has been observed in this country and in other countries that sometimes social workers are apt to take views and make pronouncements which are disproportionate and unbalanced, this Conference calls upon all social workers to be guarded and constructive in their views and actions, always taking care to avoid making statements which conflict with expert medical opinion.

LEPROLOGISTS ASSOCIATION OF INDIA

At the Third All-India Leprosy Workers' Conference held in Madras in October 1950, the Leprologists Association of India was formed with Dr. Dharmendra, Leprosy Research Worker, Calcutta School of Tropical Medicine as President, Dr. H. Shama Rao of Madura, Madras, as Treasurer and Dr. P. Sen of Calcutta as Secretary, and about twelve others as members of the Executive Committee.

The purpose of the Association is to advance scientific knowledge and practice of leprosy; to encourage and facilitate mutual acquaintance and collaboration between persons concerned in leprosy work, and the co-ordination of their efforts; to improve and safeguard the professional and social status of all medical men engaged in leprosy work. The regular membership is open to all registered practitioners of allopathic medicine engaged in leprosy work in India. The membership fee is Rs. 12 (twelve) per annum with an admission fee of Rs. 5 (five) only.

Practitioners of allopathic medicine engaged in leprosy work in countries of South East Asia including Indonesia, Burma, Malaya, Ceylon and Pakistan are also eligible for membership as Associate Members on payment of an annual fee of Rs. 6 (six) only.

All practitioners of allopathic medicine engaged in leprosy work in India and South East Asia desirous to be enrolled as members may communicate with Dr. P. Sen, Secretary, Leprologists Association of India, Leprosy Department, School of Tropical Medicine, Calcutta-12.

MASS CHEST RADIOGRAPHIC UNIT

The problem of chest diseases among the three million and odd industrial workers in India engaged the serious attention of the Indian Council of Medical Research as early as 1946, and the Council approached the Government of India to finance the scheme of Mass Chest Radiographic Unit which would go a long way to help detecting chest diseases. he first modern unit, ordered from America and assembled at Delhi, has since been purchased and made over to the All-India Institute of Hygiene and Public Health, Calcutta. This air-conditioned Radiographic Unit mounted in a van with a self contained petrol generator can be moved from place to place so that x-ray pictures can be taken even in far-off places which have no electricity. The worker has to stand only for one minute before the machine and the picture of the chest is automatically recorded. Two to three hundred pictures can be taker and developed right at the spot in a few hours. The findings are kept confidential and only the worker concerned is informed of the findings.

Industrial workers in India generally suffer from two varieties of chest diseases. (*i*) Occupational diseases like silicosis, caused by inhaling dusts in the mines and industries; and (*ii*) Tuberculosis. 45% of India's labour population or nearly one million workers are employed in textile industry and nearly 390 thousand are working in mines. Jute workers also number more than 330 thousand. Everyone of them breathe plenty of dust, whether cotton, jute or from mines and fall an easy victim to tuberculosis. A survey by the Institute of Hygiene and Public Health revealed that every 27th man in jute industry has active tuberculosis. If detected early, a large percentage of these cases may be cured after proper attention and care.

To popularise the Mass Chest Radiographic Unit in the preliminary stages, a free service to any industry has been proposed.

WHO FELLOWSHIPS PROGRAMME IN S.E. ASIA FOR 1951-52

During 1951 and 1952, the World Health Organisation proposes to make available for S.E. Asia 161 Fellowships of a total value of $329,000, announces the S.E. Asia Regional Office of WHO in New Delhi.

These 161 Fellowships will be awarded only to candidates approved by national governments of the Region through whom all applications are channelled.

During 1949 and 1950 WHO awarded a total of 71 Fellowships in the following countries of the Region: Afghanistan 3; Burma 3; Ceylon 15; India 31; Thailand 16; and Portuguese India 3.

WHO Fellowships are intended to help build up health services by enabling doctors and nurses employed by governments to obtain advanced training abroad in public health subjects like tuberculosis, malaria, venereal diseases, sanitary engineering, nursing, pædiatrics and child care, school health, health education, and mental health. The Fellowships are for periods of study up to 12 months in U.S.A., U.K., Europe, India, New Zealand, and other countries where specialised training is available.

NOBEL PRIZE, 1950.

It was announced from Stockholm that this year's Nobel Prize for Medicine has been awarded jointly to Dr. Philip S. Hench and Edward C. Kendall, of the Mayo Clinic, Rochester, Minnesota, and to Professor Tadeus Reichstein, of the University of Basle, Switzerland. This recognizes not only the recent outstanding work (first published last year) on the treatment of rheumatoid arthritis with cortisone and A.C.T.H., but Dr. Kendall's earlier important contributions to biochemistry—the first crystalline preparation of thyroxine on Christmas Day, 1914, the first synthesis of glutathione in 1929, and numerous chemical studies of the adrenal cortical hormones—and also Dr. Reichstein's fundamental chemical work on the steroids of the cortex which led him to the original discovery of cortisone, in 1937, and of desoxycorticosterone acetate, as well as his successful synthesis of vitamin C in 1933.

Dr. Hench was born in Pittsburgh in 1896, and graduated M.D. there in 1920. Practically all his professional life has been spent at the Mayo Clinic, where he became a first assistant in 1923. He has

been consultant and head of the section on rheumatic diseases since 1926, and, being much impressed by the remarkable temporary improvements often seen in sufferers from rheumatoid arthritis during periods when they are pregnant or attacked by jaundice, he has since 1929 endeavoured to track down the biochemical factor common to these two conditions which brings relief.

Dr. Kendall, who is 64, graduated from Columbia in chemistry in 1908, and, after gaining his Ph.D., worked for a short time with Parke, Davis and Co., and at St. Luke's Hospital, New York, before becoming head of the section on biochemistry at the Mayo Clinic in 1914. Since the early thirties he has worked on the chemistry of the adrenal cortex, and his Compound E (cortisone) was first produced in minute amounts in 1941: not till 1948 could Merck and Co. prepare enough for clinical trial.

Dr. Reichstein was born at Wloclawek, Poland, in 1897. His family later moved to Zurich, where Reichstein attended the technical high school, graduating as a chemical engineer in 1920. At Zurich he came under the influence of a succession of great chemists, H. Staudinger, Richard Kuhn, and L. Ruzicka, and it was the latter who persuaded him in 1931 to give up his industrially sponsored work on the flavouring matters of roasted coffee and turn to physiological chemistry. He became assistant professor at Zurich in 1934, and Professor of Pharmacy at Basle University in 1938. In 1946 he was chosen to be head of the division of organic chemistry and director of the laboratories in the same university. He has isolated more than 27 crystalline steroids from the adrenal cortex, and developed many important technical syntheses.—*Brit. M.J.*, **2**:1046, 1950.

NATIONAL HEALTH SCHEME, AUSTRALIA —FREE LIFE-SAVING DRUGS

Events have moved rapidly toward development of a national health scheme in Australia, and the first phase, the provision of free "life-saving" drugs, was implemented on September 4. The principles of the general scheme have been established and are accepted by the organized professions of medicine and pharmacy. The new Minister for Health, Sir Earle Page, F.R.C.S., maintains that the government should support only those who help themselves. Accordingly, his proposals are based on nation-wide voluntary insurance against sickness and disease. He establishes the principle that both the state and the individual have obligations in meeting the cost of treatment of sickness. Sir Earle Page intends to use all the medical and social traditions and organizations that have been built up over the years. Doctors, pharmacists, hospitals, voluntary organizations and insurance societies should administer and control their appropriate parts of the scheme as much as possible. The personal relationship between doctor and patient must not be wedged by a third party. The patient should be given a sense of personal and social responsibility.

The Australian view is that a nationalized medical programme is wasteful in its administration, disastrous in the quality of its treatment and destructive of the morale of the people. The present attitude has been encouraged by the high standard of medical care in the United States under conditions of increasing voluntary sickness insurance and medical control. The aim is to provide medical attention for all persons who require it without either reducing them to complete dependence on a government service or compelling doctors to function as government servants.

To obtain the benefit to the subsidy which the government is to provide from the national welfare fund to lessen the cost of medical and hospital charges, voluntary contributions will have to be paid to an approved insurance organization, and some part of the fees for medical treatment will still be chargeable to the patient. It is expected that nine-tenths of the cost of medical treatment will be met by such voluntary insurance and government benefit. Special provision will be made for medical service to the indigent, the aged, invalid and widow pensioners, the temporarily unemployed and other selected classes.

First Step in the Scheme—From September 4, a selection of "life-saving" drugs is made available to anyone in Australia on presentation of a doctor's prescription to a pharmaceutical chemist. The doctor uses his own duplicate prescription form and marks it "pharmaceutical benefit". There is no means test or form to be filled in by the patient. The cost of the prescription is met by the government.

The list of drugs was drawn up by a special committee of the British Medical Association. The list comprises arsenic and bismuth preparations for the treatment of syphilis, epinephrine, amyl nitrite, atropine sulfate for hypodermic injections, aureomycin, calcium gluconate, carbarsone, chiniofon, chloramphenicol, chloroquine, desoxycorticosterone, diacetylmorphine (heroin), dicumarol, digitalis in tablet form, digoxin, dimercaprol, diphtheria antitoxin, emetine, ephedrine, ergonovine maleate, ergotamine tartrate, ergotoxine, gas gangrene antitoxin, glycerin trinitrate, scopolamine, insulin, liver preparations and vitamin B_{12} for use in pernicious anemia, pentylenetetrazole, methionine, quinacrine hydrochloride, pyranisamine maleate, mersalyl, morphine hypodermic injection, nikethamide, neostigmine, pentnucleotide, oubain, oxophenarsine hydrochloride, oxytocin, protein hydrolysates for intravenous use, chlorguanide hydrochloride, pamaquine naphthoate, papaveretum (a preparation of the hydrochlorides of the alkaloids of opium), penicillin in various forms, meperidine hydrochloride, diphenylhydantoin sodium, smallpox vaccine, sulfonamides, physostigmine, picrotoxin, pituitary extract, quinidine and quinine, gold

preparations for injection, isotonic sodium chloride solution with dextrose for intravenous injection, streptomycin and its dihydro form, sulfacetimide, tetanus antitoxin, theophylline, thiouracil in various forms, thyroid, antivenine, trimethadione, tryparsamide, posterior pituitary and vitamin K for injection, vaccines and toxoids for immunization.

The pharmacy fee for each item on this schedule will be paid according to an agreed schedule, the pharmacist receiving a margin of 33⅓ per cent on the wholesale cost, plus a dispensing fee of one shilling and three pence (16 cents) plus the cost of the container where applicable. A further zonal allowance varying with the distance is added for pharmacies situated outside the main cities. When a doctor uses a scheduled drug from the stock in his office or medical bag, he replaces it by sending his prescription to the pharmacist and having the item returned to his stock. A public opinion poll shows that 46 per cent of the public think that all medicines should be free, 34 per cent want only the expensive drugs supplied, 11 per cent think that none should be fre and 9 per cent have no opinion. It is expected that 70 per cent of the cost of prescriptions for serious illness would be met by this list of drugs. The yearly cost of this provision is estimated to cost £2,500,000 for a population of 8,000,000. This represents 69 cents per head of population per year.

There are six fundamental steps in the government's proposals: (1) improvement of child nutrition by the provision of free milk, (2) a hospital building program, (3) increased financial help to pay hospital accommodation fees, (4) free provision of scheduled therapeutic and life-saving drugs, (5) government acceptance of the financial responsibility for the medical care of the indigent and pensioners by private medical practitioers and (6) subsidy toward the medical and hospital costs of those persons who show a desire to help themselves. This subsidy would be about 36 per cent of total medical costs. The balance would be met by the voluntary insurance benefit, financed by a weekly premium of three shillings (33 cents) and about 10 per cent of the cost paid by the patient at the time.—*J.A.M.A.*, **144**:706, 1950.

EDUCATION AND MEDICINE

In spite of the fact that the Moran, Goodenough, and Cohen committees have all deplored the launching of boys and girls into the narrow stream of medical education at an increasingly early age, the process still continues. Dr. L. Birley, the headmaster of Eton, has recently spoken on the subject of medical education at a meeting of the Section of Medicine at the Royal Society of Medicine (reported in *Brit.M.J.*, **2**:1053, 1950), and he made it quite clear that headmasters were not in favour of such early specialization. He described the first M.B. examination as "a very difficult and exceedingly tiresome problem", and he did little to hide his own poor opinion of its suitability as a test for boys and girls still at school. One intelligent boy's failure to pass the biology section of the first M.B. he ascribed to the boy's inability to suppress a wide range of interests, with the result that "he had not really tackled the subject of biology in a way which would have been most efficacious for the first M.B. examination." This is surely a most scathing comment. Of course Dr. Birley was not speaking against the examination as such, but against the system which forces schoolchildren to take it before they can become medical students at a university or medical school. Under the same system the boy or girl who is up to scholarship standard in classics, history, or modern languages is finding it increasingly difficult to obtain permission to study medicine at some universities. At Cambridge, for instance, Dr. Birley states that the medical faculty have quite definitely abandoned any idea of giving tuition for the first M.B. examination. On the other hand, there are some hospital medical schools which students taking the pre-medical course find it easier to enter than those taking the pre-clinical course. A writer in *The Times' Educational Supplement* has recently stated that students who have obtained a Higher School Certificate with exemption from first M.B. may fail to gain admission to a medical school.

Most school teachers would agree that the wide range of learning which lies open to inquiring minds usually becomes visible and inviting some time between the ages of 16 and 18. Medical students should not necessarily be drawn only from those who answer the invitation by applying themselves to a closer study of the behaviour of matter, nor should those who are not going to be scientists have the perquisite of avoiding the study of science. As Sir Henry Cohen said, when speaking after Dr. Birley at the R.S.M. meeting, it was important not only that the medical student of the future should have a general cultural background but that in this increasingly scientific age such a background (which naturally included science) should be afforded to the general community. It is of course true that the student who feels the lack of the cultural background which should have been painted in for him at school will seek it, and usually obtain it, at the university, medical school, or even hospital, as Dr. D. McL. Johnson recently testified in the *British Medical Journal*. For this reason there is much to be said for the practice at Liverpool University which Sir Henry Cohen described. Here first-year medical students who have obtained exemption from one or more parts of the first M.B. examination can choose to attend any university course they like—history, logic, psychology, etc.—while also studying the pre-medical subject or subjects in which they had not reached a sufficient standard at school.

To arguments about medical education there is no end. But in the long run what is taught matters less than those who learn and those who teach. It may be a counsel of perfection, but there should be no difficulty in training good doctors if the same care was taken to select students as the Admiralty takes to select naval officers and if all teaching was given in schools, universities, and hospitals—by those

who could inspire as well as instruct.—*Brit.M.J.*, 2: 1105, 195.

I.M.A. RELIEF CAMP

The Relief Camp Hospital and its outdoor centre opened at Bongaon rly. station at the border of West Bengal since March, 1950 have been closed from the 1st December, 1950 as the number of bonafide sick refugees has been considerably reduced. The I.M.A., Bengal Provincial Branch, with the help of financial assistance from members of the Association from different parts of India and the H.E. the Governor of West Bengal's Fund could carry on this relief work which was very much appreciated. H.E. the Governor of West Bengal, Hon'ble Sri Jawaharlal Nehru, Dr. Chamanlal Mehta, President, I.M.A., Dr. S. C. Sen, General Secretary, I.M.A. and other top-ranking leaders of I.M.A. and political leaders visited this centre from time to time and encouraged the workers on their noble mission.

W. BENGAL MEDICAL COUNCIL ELECTION

As a result of scrutiny of voting papers for election to the West Bengal Medical Council, Dr. P. Bose, Dr. T. Acharjee, Dr. P. K. Guha and Dr. B. K. Ghosh have been elected from the Calcutta University medical graduates' constituency. Dr. K. N. Bose, Dr. A. D. Mukharji and Dr. Anibhusan Bera have been elected from the licentiates' and others' constituency, Drs. P. Roy and S. K. Chatterjee have been elected from the constituency of foreign qualified doctors uncontested. This was the first election after the independence of the country and partition of Bengal.

BOMBAY MEDICAL COUNCIL ACT

The Bombay Legislative Assembly at its last session amended the Bombay Medical Council Act.

DR. CHAMANLAL MEHTA

Dr. Chamanlal Mehta, President, I.M.A., after attending the Coimbatore meeting of the Working Committee of I.M.A. had a fly to Cochin to inaugurate the Travancore and Cochin Medical Conference and then went to Ootocamund where also he addressed the local I.M.A. branch members.

Dr. Mehta and other members of the Working Committee were entertained at a tea party on the 28th October by the members of the Coimbatore Medical Association at their spacious newly constructed Assembly Hall.

MEDICAL COUNCIL OF INDIA

Members of the Medical Council of India assembled for an ordinary quarterly meeting of the Council at Madras on 28th October, '50 under the presidentship of Hon'ble Dr. B. C. Roy, condoled the death of its President, Dr. K. S. Ray, and adjourned to a date in January, 1951 without transacting any business in honour of late Dr. Ray.

CORRESPONDENCE

The editor is not responsible for any views expressed by contributors

SKIN CLINIC IN A TEACHING HOSPITAL

Sir,—It is high time that the Indian Medical Association should think over the matter of National Health Services in the country and the proper distribution of medical men all over the country with the help of the Provincial and Central Governments.

I like to draw the attention of your readers, and the members of the Association in particular, to the *British Medical Journal* of the 21st Jany., 1950 regarding "The Consultant Services" which has been published from the Ministry.

Besides a host of other things dealt with I might point out the portion regarding "Teaching Hospitals". It runs, "These hospitals will collaborate with other hospitals in the region where necessary, especially for instruction in tuberculosis, infectious disease and mental disease. Refresher courses for general practitioners should be provided and other forms of contact between general practitioners and hospitals encouraged and developed. Post-graduate education requires the closest co-operation between university, teaching hospital, regional board and hospital management committees." It is time that three months' post-graduate course in medicine and surgery should be started by the Deans of the Faculty of Medicine of different universities where the general practitioners must attend for three months every other year and will also be suitable for post-graduate students going up for M.D., M.S. and Ph.D., etc.

In medicine the subjects must be taught with general lectures, clinics and demonstrations by the seniors and the juniors of the teaching hospitals and the subjects must include general medicine, pathology, psychological medicine, pædiatrics, cardiology, dermatology, diseases of the chest, infectious diseases and in surgery, general surgery, obstetrics and gynæcology, pathology, anæsthetics, surgery of the chest, e.n.t., ophthalmology, neurology and neurosurgery, plastic surgery, traumatic and orthopædic surgery and venereal diseases.

As regards dermatology which is so very important in the tropics it should be in the lines of these countries. In this country, "Clinics in dermatology should be held at all hospital centres. Ten beds will be sufficient for a population of 100,000. But such units, since they are small, could be well-grouped. Separate hospitals are undesirable, except for post-graduate training and research. One whole-time dermatologist could undertake the work of three centres, each serving a population of about 100,000. One registrar and a number of clinical assistants—mainly general practitioners in the area—will be required in each group."

According to the Bhore Committee recommendations skin clinics should be opened up with ten in-door beds and with a staff of a whole-time dermatologist and lecturer in dermatology, registrar, demonstrator

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BENGAL CHEMICAL AND PHARMACEUTICAL WORKS LD.

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in dermatology and house physician in every teaching hospital in India now.—I am, etc.,

K. D. LAHIRI, M.B.B.S., F.D.S. (LOND.),
24-2-1950 Research Worker & Clinical Assistant,
Edinburgh. Skin Dept., Royal Infirmary and
University of Edinburgh, U.K.

DOCTORS' DRESS

Sir,—I am amused to read the lengthy correspondence on the above subject. For the life of me I cannot understand why doctors should have special uniforms or distinguishing badges or armbands? Why should we be so anxious to advertise ourselves? If exhibition of a stethoscope is unethical, a distinctive sign, to my mind, is not only worse but vulgar. But if the consensus of opinion among members of our fraternity is in favour of some mark of distinction as representatives of a noble profession, I humbly suggest that instead of one uniform armband for all medicos, there should be armbands with different insignias for different specialities—*e.g.*, skull and cross-bones for surgeons; microscope for physicians; stethoscope for general practitioners; fœtus for obstetricians and gynæcologists; dentures for dentists; nose for e.n.t. men; eye for ophthalmologists, and so on, and last but not the least, coffin or a pile of burning wood for undertakers, for, are not these gentlemen, to a certain extent, dependent on us for their prosperity?—I am, etc.

15-8-50. H. M. DESAI, F.R.C.S. (ED.).
Ahmedabad.

I.M.A. PROBLEM

Sir,—India has gained her full independence. It is about 3 years since we achieved our long-cherished freedom, but medical problems still remain to be solved. The administrative posts in fair number are held by non-medical persons, though there are very highly qualified, intelligent, efficient and administration-minded men among the doctors. The simple reason for such poor representation in the administration is that we are neither fully organised nor is our Association ventilating our viewpoints, desires and needs to the Government to the fullest extent. There is an overwhelmingly large number of qualified doctors in the country but only a poor number of them have enlisted themselves as members of the I.M.A. This shows that we are still lacking in fully organising ourselves for the purpose of a unanimous, solely representative and responsible body. We cannot have our united strength unless we organise.

I, therefore, suggest that all the qualified doctors should enrol themselves as members of the I.M.A. branch of the area where they reside without any further loss of time. Members so enrolled should form a local branch of the I.M.A. and each of such branches will elect its President and Secretary from among its enlisted members. The President and the Secretary so elected will represent their branch to form the Provincial Branch which also should elect its President and Secretary from among such representatives. The Provincial President and Secretary so elected should form the central body of the I.M.A. which also will elect its President and Secretary who will represent the I.M.A. to the W.M.A. and will have regular relations with all.

Each such enrolled member should pay Rs. 10|- (ten rupees) to the I.M.A. branch of the place. Out of such collections one half should be sent to the Journal Department for the regular supply of one copy to each of the enrolled members and half of the remaining half to the State or Provincial Branch which also after such collections, will send half of the received amount to the Central Body fund of the I.M.A. So, the initial branch is to retain practically ¼th of the total subscription, and will spend the amount for the maintenance of the local branch office, and its other necessary works, such as donations, help, contributions, charity and emergency purposes. The Provincial Branch should spend out of the fund thus collected towards the maintenance of its Provincial Branch office, help to the medical college students, and other necessary matters. The Central Body of the I.M.A. should spend all the funds so collected towards the maintenance of its central I.M.A. office, to help the deserving medical students going abroad, and to other items involving national and international affairs.

Besides the compulsoy holding of annual conferences in different parts in rotations by Central, Provincial and Local branches, the Working Committee of the Central Body should meet thrice, that of the provincial six times and that of the local branches twelve times a year. The Working Committee of the local branch should meet in the first week of the month, that of the Provincial by the middle and the Central by the last week of the month. The dates of holding such meeting should be kept already fixed, so that much of the botherations be averted and the smooth and efficient working be assured.

I hope, the respectable members of the profession will give an effective hearing and will bring it into practice from the beginning of 1951. Jai Hind.—I am etc.

9-9-50 D. R. YADAVA.
Samastipur, Bihar.

AYURVEDA & ONE DRUG HAVING DIVERSE EFFECTS IN A NUMBER OF DISEASES

Sir,—I read an article about "The Development of ACTH and the Role of the Adrenal Gland in Human Disease" by John R. Mete, M.D. in the April, 1950 issue of W.M.A. Bulletin. My impressions are in short as under.

The article is extremely interesting and is a real example of team-work almost the world over.

That one substance has such diverse effects on a number of diseases and disease syndromes is remarkable. Some are cured, some are accelerated and some are cured after apparent exacerbation. On some it had apparently no effect but the beneficial effect appeared after discontinuing the drug. The drug is used in very small quantities.

In our Ayurveda (The Indian System of medicines) the concept of disease in a nut-shell is this:—

There are three hypothetical substances in the body—Vata, Pitta and Kapha. These three when they

remain in their proportions with one another keep the body in health. If by any cause one of them gets increased or decreased or changes its nature, the normal proportion of the three is lost and this causes diseases. When by any method of treatment the three regain equilibrium the normal condition of health returns.

Moreover, it is supposed that these three substances remain in the body in certain places only, and from there they influence the working of the whole body and work in collaboration with one another so that by a change in the quality or quantity of any of these, various diseases and disease syndromes which look quite distinct make their appearance.

I, therefore, imagine that this ACTH is probably one of these hypothetical substances imagined in Ayurveda. By such an hypothesis, the diverse effects of ACTH can be explained. I have recently come across an article where one of our eminent pathologists has said that he believes that in the end pathology will boil down to these three substances, *viz.*, Vata, Pitta and Kapha, as taught by Ayurveda. I cannot trace the article of that pathologist, but I am sure, if he reads this article and the article under reference, he will be able to throw more light upon this question and will also contact Dr. S. C. Sen who is a member of the W.M.A. and thus will bring the solution nearer.—I am, etc.,

29-9-50. RAJANINATH R. GHAREKHAN, M.B.B.S.,
Baroda. L.M. (DUB.), D.T.M. & H. (LOND.).

The comparison is hardly justified—EDITOR, *J.I.M.A.*

RE-ORGASISATION OF MEDICAL CURRICULUM

Sir,—With reference to the questions for which the Indian Medical Council desires comments, I agree with the view (*a*) that the medical curriculum can be shortened to 4½ years, (*b*) that the training in preventive medicine should be given partly during the students' medical course and partly during the course of internship and (*c*) that the periodical examinations should be held every month by the college and that the results should be forwarded to the university, to be taken into account at the time of the university examinations for assessing the candidates' ability.

(*a*) With regard to the proposal to shorten the course for IM.B.B.S. from 2 year to 1½ years I may draw attention to the fact that it is not the total period of course for IM.B.B.S. that will determine ultimately the extent of the training but it is the total number of hours of work that have to be fixed.

(*b*) It is also found that the number of working hours for IM.B.B.S. course and their distribution between anatomy and physiology differ from province to province and from college to college in the same province. Uniformity in this regard is necessary.

(*c*) I am aware of the criticism that too many didactic lectures are given and that too many details are taught. But at the same time I would like to point out that the standard of the student with regard to general knowledge as well as basic sciences is very low and that the practical training in physiology in India is very much below the standard in British and American universities. Therefore, while the number of lectures may be cut down by limiting the teaching to the principles of general physiology with particular reference to human physiology and also stressing the clinical applications, more attention and time than at present, should be given to the training of the students in practical physiology, human physiology in particular, by providing adequate number of hours for practical work.

(*d*) Since it is considered advisable to reduce the number of lectures and to give better training in practicals, I am of opinion that 1,000 hours be allotted for teaching IM.B.B.S. courses and that these hours be equally distributed between anatomy (including embryology and histology) and physiology (including biophysics and biochemistry). Of the 500 hours of physiology, $^{2}/_{5}$ths (200 hrs.) may be reserved for lectures and $^{3}/_{5}$ths (300 hours) for practical work.

It is advisable to have biophysics and biochemistry taught in the department of physiology, by separate lecturers, if necessary. But if separate arrangements have to be made, $33^{1}/_{3}$ per cent of 300 practical hours, may be allotted for teaching biophysics and biochemistry, included under physiology for IM.B.B.S. courses.

(*e*) The correlation between the teaching of anatomy and physiology will reduce reduplication and also emphasise that the same subject, *viz.*, the human body—is treated in its two different aspects. The programme in teaching anatomy and physiology may be so coordinated that the student gets at the same time a comprehensive knowledge of the structure and the functions of important systems of human body. Physiology cannot be understood without a knowledge of anatomy and biochemistry and biophysics. Hence, in the first half of the course for IM.B.B.S., the teaching in anatomy, biophysics and biochemistry should be more intensive. Biophysics and biochemistry may be taught in the department of physiology by special lectures, to bring about the proper co-ordination in the teaching of physiology. During the next half of the IM.B.B.S. Course the teaching in physiology can be more intensive.

With regard to bridging the gap between the preclinical and clinical studies, as it is not desirable or feasible to take the students to the hospital in the last term to show various types of cases, the students may be given an introductory clinical course for 3 months, after completion of IM.B.B.S. course as proposed in the resolution.

Even though there is one teacher for every 12 students, this alone will not ensure proper standard of teaching a subject like physiology where both study and training are required to make a teacher. Hence, the staff that fulfils the above proportions must be trained and must be permanent. This can be ensured only by giving better salaries than at present with allowances that can compensate loss of private practice. These must be on a uniform level in all medical colleges in India. Post-graduate study by these teachers must also be encouraged.—I am, etc.

24-11-50. Medical Educationist.
Madras.

REVIEWS

PROGRESS IN THERAPEUTICS—Jyoti Dhar. First Reprinted Edition, 1950. The IMAR Publishers, 34, Alipore Road, Calcutta 27, Price Rs. 15|-, Pp. 561 + xxvii.

This volume is a reprint of several articles which appeared in the International Medical Abstracts and Reviews under the caption "Progress in Therapeutics".

It is very difficult now-a-days to keep pace with the progress in medicine and one who will bring these together in one volume will naturally earn the gratitude of the general practitioners. Dr. Dhar, therefore, has done a very good job by bringing out this volume which we hope will have the success it deserves.

The book is divided into ten sections dealing with antibiotic therapy in general practice, sulphonamide, sulphones in leproses and chemotherapy of malaria, vitamin therapy, biological products, sex hormone therapy, miscellaneous; and then come the supplementary notes and appendices.

The book contains the latest news on various common drugs. The information given is accurate and will be useful for day-to-day reference of the busy practitioner.

FEVERS FOR NURSES—Gerald E. Breen. Third Edition, 1950. Published by E. & S. Livingstone Ltd., 16 & 17, Teviot Place, Edinburgh. Pp. 219 +viii.

The unusual title of this book should not distract anybody from the substance it contains.

The first four chapters dealing with general features, what to observe and report in fever cases, principles of prevention and drugs and their administration contain mines of information.

Other chapters dealing with streptococcal infection, diphtheria, small pox, vaccination and chicken pox, the respiratory infections, infections of the nervous system, care of the newborn, rubella, mumps and influenza contain much practical hints for nurses, *e.g.*, on p. 133 is written,—"Nurses themselves should not be careless in the use of the nail scissors or orange stick; septic fingers are almost endemic amongst the staff of measles wards, showing how easily infection may be acquired or transmitted by the discharge so prevalent in this disease."

We commend this book to both doctors and nurses.

ADVANCES IN SURGERY—Edited by a Board of Editors with William Dewitt Andrus as Chairman. Volume 2, 1949, Published by Interscience Publishers, Inc., 215, Fourth Avenue, New York-3, N.Y. Price $11·00.

Interscience Publishers are publishing for the last few years the "advances in" series. This volume is the second of the Surgery series. In contradistinction to usual year books, the book contains eleven monographs by people doing research work on various branches in surgery. As a result, the book is essentially of a very high order. The monograph gives not only the latest advances but also the lifetime work of some pioneers. The subjects included in this volume are—pulmonary function studies in relation to chest surgery, advances in surgery of the œsophagus, surgical treatment of hypertension, portal bed block and portal hypertension, surgery of the congenital anomalies of the heart and great vessels, recent advances in the treatment of craniocerebral injuries, use of streptomycin in the treatment of surgical infections, advances in skin grafting, the pathology of the tumours of the peripheral nerves, testis tumours, advances in the management of pancreaticoduodenal cancers.

We recommend this book to all serious students of surgery.

MASTERING YOUR NERVES—By A. T. W. Simeons. First Indian Edition, pp. 205. Published by D. B. Taraporevala, Sons & Co., 210, Hornby Road, Fort, Bombay 1. Price Rs. 4/-.

This is a very interesting book pleasantly written. In this world of worries, black marketing, and wants, one will naturally be interested to know how he can have some peace with himself by mastering himself. This book might help him. The book also contains eight diagrams which may assist the doctors to understand the psychic basis of a few common somatic ailments. We recommend this book to interested doctors and lay people.

THE MEDICAL ANNUAL, 1950—66th year. Edited by Sir Henry Tidy and A. Rendle Short, pp. 439.

This annual compendium of knowledge is again on the market for the practising physician. For the medical man who has already got the medical annual habit, this announcement will be welcome. To those who are uninitiated we can promise a useful period of study of recent medical literature. Monographs on gastric and duodenal ulcer, gerontology, hypertension, liver diseases, radiotherapy, to mention a few will be found to be very useful. The book as usual is full of recent data on medical progress.

X Bengal Provincial Medical Conference

The Tenth Bengal Provincial Medical Conference will be held at Baruipur (24 Pargs.) on Sunday the 18th February, 1951. Dr. A. C. Ukil, M.D., M.S.P.E. (Paris) will preside.

CURRENT MEDICAL LITERATURE

Early Manifestations of Disseminated Sclerosis

Adams and others (*Brit. M. J.*, **2**:431, 1950) from analysis of symptoms and signs of 389 cases of disseminated sclerosis observe:

Weakness in one or more limbs was the first symptom in more than half the cases examined, while visual upset was the earliest manifestation in a further 26% of the patients.

The onset of the disease was found generally to occur in the age group 20-45 years, and when disseminated sclerosis is suspected in patients outside these limits other ætiological factors should be carefully considered.

For the development of disseminated sclerosis personal susceptibility is of importance, and in the experience of the authors the incidence of the disease is greatest in those with a sympatheticotonic diathesis.

Reference is made to those clinical signs which are of importance in distinguishing disseminated sclerosis from the manifestations of hysteria. In this connexion significance should be attached to the association of overactive knee-jerks and sluggish or readily exhausted abdominal skin reflexes. Other signs of diagnostic value are the mental state of the patient, the presence of neurovascular phenomena, and the triad of ocular imbalance, mydriasis, and hippus.

Stress is laid on the need for recognition of the disease before permanent damage has been inflicted on the central nervous system. Whatever advances in treatment the future may hold, the degree of recovery will depend on the stage at which a diagnosis is first established.

Chronic Liver Disease following Infectious Hepatitis

Kunkel and Labby (*Ann. Int. Med.*, **32**:443, 1950) describe five patients who developed clinical evidence of severe cirrhosis from two to six years after an attack of infectious hepatitis.

Associated bacterial infection, strenuous activity during the initial attack and during relapse, alcohol and the age of the individuals appeared to have been contributing factors in the development of cirrhosis.

The clinical course of the five patients differed from that usually seen in Laennec's cirrhosis in that the disease was progressive and not materially affected by therapy. Severe abnormalities in various proteins of the serum were also characteristic. The late manifestations of the disease resembled those described in the past under Banti's syndrome.

The characteristic pathological lesion was an irregular nodular hyperplasia of liver cells between broad areas of contracted reticulum and fibrous tissue. In four of the five patients the picture differed from that seen in classical Laennec's cirrhosis. Various gradations were seen in the different patients between cirrhosis with huge nodules of regenerated liver cells widely separated by a loose fibrous tissue stroma, to finely nodular cirrhosis with regular formation of islands of parenchyma by bands of fibrous tissue.

Clinical Studies on Malignant Hepatitis

Salvesen and Lodden (*Acta med. Scand.*, **137**:305, 1950, *J.A.M.A.*, **144**:427, 1950) review observations on 26 cases of malignant hepatitis. They apply the term "malignant" to that from of hepatitis which lasts more than three months or terminates in death with signs of acute or subacute yellow atrophy. All except three of the 26 patients were women. The majority of the fatal cases occurred during the war period. Fourteen cases of benign hepatitis were observed during the time that the 26 malignant cases were observed; these were divided equally among the two sexes. Of the 23 women with the malignant type 18 were dead and only two were cured after nine and 11 months. Three are living with a chronic hepatitis and have been observed for three and a half, four and a half and six years, respectively. One of the three men with the malignant type of hepatitis died. Of the 19 patients who died, 14 did so within a year and five died 15 months to five years after onset. The disease often causes severe pain resembling that caused by gallstones. Ascites may occur and disappear; glossitis may be severe; hæmatemesis may appear; there may be incipient coma (transient "absence"); the serum proteins show decisive changes, the albumin-globulin ratio may be well below one (enormous rise in globulin, but hypoalbuminæmia) and there frequently exists a decided hyperproteinæmia. The authors report the histories of the three patients in whom the malignant hepatitis had a protracted course. They do not believe that the malignant form of hepatitis has an etiology different from that or ordinary sporadic and epidemic hepatitis seen in peacetime.

Acute Rheumatic Carditis in Patients over 40

Wroblewski and Messinger (*Am. Heart J.*, **40**:345, 1950) write that thirty-four case records of histologically active rheumatic heart disease in patients over 40 years of age were studied.

The histologic manifestations of rheumatic activity in these patients were compared with the clinical histories. Contrary to the expectations, this study did not result in a good clinicopathological correlation. Only in the arbitrary Group I was clinicohistologic correlation satisfactory.

Three groups of patients have been described as to their clinical manifestations. In general, their counterpart can be found in the younger age groups.

It is suggested that the occurrence of active rheumatic carditis in older patients should be considered more frequently so that the clinical diagnosis will be made more often. Unexplained fever and unusual responses to digitalis may be clues to this end.

Rheumatic Heart Disease in Old Age

Kaufman and Poliakoff (*Ann. Int. Med.*, **32**:889, 1950) in presenting a clinical-pathological study of findings in rheumatic heart disease in old age observe:

Among 263 consecutive autopsies, 50 cases (19 per cent) of rheumatic heart disease between the ages of 40 and 81 (average 57·3 years) were found. Twenty-eight per cent of the group was betweeen the ages of 40 and 50 and 72 per cent between 50 and 81 years. These figures indicate that rheumatic heart disease is quite frequent in old age. If sought with the same diligence as in rheumatic heart disease of the young, the correct diagnosis would be made more frequently.

A positive history of rheumatic fever was obtained in 19 of the 31 more advanced cases and in 20 of the total group (40 per cent).

In 16 of the 50 cases (32 per cent) clinical activity was found in the wards, and confirmed at necropsy. A chart review

indicated activity in four more cases making a total of 20 patient (40 per cent) with signs of activity.

Rheumatic heart disease, active was the chief cause of death in at least 32 per cent of the patients in this series. Rheumatic heart disease was the chief cause of death in 64 per cent of the total having this lesion.

Hypertension was found in 13 (26 per cent) of this series. Seven of these died from causes related to hypertension.

Pathologic lesions in the liver were found clinically in 76 per cent, and at necropsy in 86 per cent of the cases. Cardiac cirrhosis at autopsy was reported in 10 (20 per cent), fatty degeneration of the liver cells in six additional cases.

Significant pulmonary complications, aside from pulmonary congestions were reported in 18 (36 per cent). There were five cases of pulmonary infarct, five cases of pneumonia, and two of tuberculosis.

A correct diagnosis of rheumatic etiology was made in 62 per cent of the total series and in 82 per cent of the 31 more advanced cases.

Senile Prostatic Rheumatism

Michez (*Bruxellas. Med.*, **30**:178, 1950, Ref. *Patna J. Med.*, **24**:276, 1950) describes a form of polyarthritis named by the authors "senile prostatic rheumatism". It affects elderly men, and is accompanied by prostatic symptoms. The onset is usually acute with pain and swelling of the hands and feet. A characteristic feature is œdema of the joints, soon followed by a fibrosis of the periarticular tissues. The swollen fingers are held in semiflexion, and movement is impossible. After weeks or months joints become less swollen but remain stiff; there is no deformity of the joints, but the fingers are fixed in a semiflexed position by fibrosis. The same process may involve feet, knees and lumbar spine. Joint symptoms are accompanied by severe malaise. Radiologically, rapid decalcification of subarticular bone is visible, but there are no joint changes. The erythrocyte sedimentation rate is raised to from 40 to 80 places in one hour (Westergren).

The condition does not respond to gold therapy. Rapid improvement, however, usually follows the administration of stilboestrol. A daily dose of 5 mgm is given—only 2 out of 12 cases did not respond. When joint swelling abated physiotherapy was needed for the residual fibrosis.

Insulin Resistance in Diabetes

Bose (*Indian M. Gaz.*, **85**:445, 1950) writes: Apart from the usual causes of uncontrollable hyperglycæmia in spite of extraordinarily high dosage of insulin, such as acute and chronic infections, disturbance of liver function, allergy, etc., two outstanding causes of insulin resistance were found to be (a) condition of thyrotoxicosis co-existing with diabetes and (*b*) lack of glutathione content of blood in diabetic subjects.

Treatment of thyrotoxicosis with thiouracil has been found to make the patient less resistant to insulin and reduce the insulin requirement drastically in most cases.

Some cases of diabetes with a lowered glutathione content of blood were found to be extremley resistant to insulin. Feeding with methionine in these cases had a marked effect on the insulin requirement, which could be substantially reduced or even stopped.

Oral administration of methionine has also been found to lessen or even eliminate the need of insulin in cases of diabetes not necessarily resistant to insulin.

Diabetes Mellitus and Liver Dysfunction

Leevy and his associates (*Am. J. Med.*, **8**:290, 1950) performed a battery of hepatic tests in 380 patients with diabetes mellitus in an effort to determine the incidence of liver dysfunction and its relationship to the etiology of hyperglycemia and glycosuria. One hudred and forty-eight (38·9 per cent) of the patients had evidence of hepatic dysfunction and 232 had normal hepatic function. Sex, age and duration of diabetes had no apparent influence on the incidence of hepatic dysfunction, but this incidence seemed to increase moderately with the total insulin requirement and quite decidedly with complicating pathologic conditions. Thirty selected diabetic patients were subjected to needle biopsy of the liver. Of eight with normal hepatic function five had normal livers and two had fatty metamorphosis on histologic examination. Of 22 with liver dysfunction, histologic examination revealed normal tissue in nine instances, fatty metamorphosis in five instances and portal cirrhosis in eight instances.

Sixty-five patients with the diabetic syndrome and evidence of hepatic dysfunction have been followed up for periods of more than 12 months on a hepatic regimen. Correlation of history, physical examination, function studies and therapeutic response suggests hepatic dysfunction was responsible for abnormal carbohydrate metabolism in 15 patients, liver dysfunction was secondary to diabetes in 48 patients and liver disease and diabetes were coincidental in two patients. One patient had diabetes and hepatic dysfunction which were attributed to obesity.

The authors feel that hepatic studies aid in the evaluation of patients with a provisional diagnosis of diabetes mellitus and constitute a good method of periodically evaluating the degree of control of diabetic patients.

Liver dysfunction may occasionally produce the diabetic syndrome or be secondary to it. In 11 patients in whom hepatic diseases was believed to be the cause of hyperglycemia with glycosuria, hepatic therapy without insulin resulted in improvement in the hepatic dysfunction and carbohydrate disturbance. Of 35 patients with liver dysfunction secondary to diabetes, the hepatic abnormality and carbohydrate tolerance improved with hepatic therapy and insulin in 30.

Haemopoietic Changes during Administration of Chloramphenicol (Chloromycetin)

Volini and his associates (*J. A. M. A.*, **142**:1332, 1950) say that in three patients, two with typhoid (in one instance complicated by amœbiasis) and one with brucellosis, profound blood and marrow changes were observed during chloramphenicol therapy. These changes consisted of a precipitous fall in the total leukocyte count, which occurred by the seventh day in one case and continued as long as the drug was administered. The leukopenia resulted primarily from a decrease in the number of granulocytes in the marrow due to a maturation arrest without significant alteration in the monocytes or lymphocytes.

Severe anæmia occurred in one case, with an erythroid maturation arrest in the marrow. No significant changes occurred in the platelet count in the one instance in which this factor was studied. Both marrow and blood changes were

reversible, and an immediate rise of the white blood cell count followed discontinuation of therapy.

The authors cite factors which speak for a cause and effect relationship between the administration of the drug and the changes in marrow and blood.

These toxic effects of chloramphenicol assume added importance, because of the recent recommendation to administer chloramphenicol for longer period in typhoid to prevent clinical and bacteriologic relapses. The toxic manifestations of this drug in man will have to be studied more extensively before it can be considered an absolutely safe therapeutic agent. This is particularly true in the instances in which large total dosages are employed over relatively short time periods, as in the three cases reported herein.—*U. S. Med. New Letter.*

Tuberculous Peritonitis Treated with Streptomycin

Wichelhausen and Brown (*Am. J. Med.*, **8**:421, 1950) present the results obtained with streptomycin in the treatment of 26 patients with tuberculous peritonitis. A favourable response was obtained in all except one of the patients, who had a coexisting pulmonary tuberculosis and died.

Four of the improved patients had a relapse. Two of them responded to a second course of streptomycin; one failed to respond. One patient was not retreated and died following a relapse.

A majority of the patients had been seriously ill and many were chronically ill. The uniformity and rapidity of response, the subsidence of fever and abdonimal sypmtoms, the general improvement, the objective improvment observed in three follow-up laparotomies and the fact that six patients have returned to work are indications of the effect of the drug. In most instances streptomycin therapy changed the trend and shortened the disease process. The duration and type of peritoneal involvement did not influence the response to therapy. Tuberculosis of the peritoneum responded as well as or better than coexisting tuberculous lesions elsewhere, but streptomycin did not prevent the development of new lesions.

Daily dosage of streptomycin varied between 1 and 3 gm. given intramuscularly in two to six divided doses. Total dosage per patient varied from 42 gm. to 254 gm. for a single course. One of the four patients treated with two courses of streptomycin received a tootal of 349·2 gm. of strpetomycin. With these doses streptomycin blood levels between 1·25 and 40 micrograms were obtained. It is of intereest that in one patient whose blood levels varied between 3·2 and 15·2 micrograms an ascitic fluid streptomycin level of 11·7 micrograms was obtained, indicating that there is adequate diffusion of streptomycin into the abdominal cavity. Duration of therapy varied between 21 and 137 days but one of the patients who received two courses of streptomycin had a total of 164 days of treatment.

Although immediate improvement following streptomycin therapy was excellent in most cases, continued observations will be necessary to determine the efficiency of streptomycin in the ultimate control of the disease. The development of new extraperitoneal lesions during and after therapy and the persistence of histologic evidence of tuberculosis in two cases make the prognosis extremely guarded.—*U. S. Med. News Letter.*

Terramycin

Subsequent work on the antibiotic terramycin, produced by Streptomyces rimosus, is justifying the hopes of its discoverers, Finlay and his colleagues (*Science*, **111**:85, 1950) of New York. It is a crystalline compound which forms salts with both acids and bases; these are stable at room-temperature and may be kept without loss of potency for at least a year. Pharmacological tests and limited clinical trials by Herrell *et al* (*Proc. Staff Meet. Mayo Clin.*, **25**:183, 1950) at the Mayo Clinic have confirmed that the new antibiotic has a wide bacterial spectrum *in vitro* and *in vivo*, being effective against gram-positive organisms and some rickettsiae and viruses. In many respects terramycin is comparable in its range of activity to 'aureomycin', and like aureomycin and chloramphenicol it is effective by mouth. When given in doses of 500-750 mg. six-hourly (*i.e.*, 2-3 g. daily) it can be detected in active concentrations in the blood, cerebrospinal fluid, pleural cavity, bile, urine, and faeces. It also passes the placental barrier, and so can be given in pregnancy for the treatment of mother and foetus. Terramycin is relatively non-toxic, and according to Herrell *et al*, the diarrhœa, nausea, and vomiting that sometimes occur when it is taken on an empty stomach can be overcome by giving it in a capsule with milk. The only other side-effect observed is glossitis, which has also been described with other antibiotics taken by mouth. With ordinary dosage the terramycin excreted in the faeces may produce concentrations as high as 2·5 mg. per ml., which will have much the same effect on the bacterial flora as the oral administration of aureomycin; clostridia, streptococci, and coliform organisms disappear and the faeces become odourless. Considerably higher concentrations are attained in the urine with terramycin than with aureomycin after comparable dosage by mouth.

Among the organisms sensitive to terramycin are pneumococci, *Staph. aureus*, haemolytic and non-haemolytic streptococci, *Strep. faecalis*, gonococci, *Haemophilus influenzae*, *H. pertussis*, *Br. abortus*, *suis*, and *melitensis*, *Klebsiella pneumoniae* (Friedlander's bacillus), *Bact. coli*, *Ps. pyocyanea*, *Pasteurella tularensis*, spirochaetes, the rickettsiae of typhus, Rocky Mountain spotted fever, Q fever, and rickettsial-pox, and the viruses of primary atypical pneumonia, lymphogranuloma venereum, and influenza. The preliminary clinical trials published by Herrell *et al* (*loc. cit.*), King *et al* (*J.A.M.A.*, **143**:1, 1950) and Hendricks *et al* (*Ibid.*, p. 4) in the United States show that the conditions responding satisfactorily to terramycin include pneumococcal pneumonia; urinary tract infections due to *Bact. coli*, *Ps. pyocyanea*, and streptococci; bacteraemia due to susceptible organisms; lung abscesses; follicular tonsillitis; and erythema multiforme. Hendricks and his colleagues have tried it in syphilis, gonorrhoea, and granuloma inguinale. After two doses of 1-2 g., with 6 hours between, the cure-rate claimed in gonorrhoea is 80-100%. It is too soon for any opinion on the ultimate value of terramycin in syphilis, but it will cause the spirochaetæ to disappear from the local lesion in 24-48 hours and a negative serological test is obtained a month after treatment. Only 2 patients with granuloma inguinale were treated but in both of these the lesions had cleared by the third day.—*Lancet*, **1**:1030, 1950.

Aureomycin in Hepatic Disease

Farquhar and others (*Am. J. M. Sc.*, **220**:166, 1950) write: Four cases of acute hepatic coma—2 secondary to acute viral hepatitis, and 2 to portal cirrhosis—were treated both

parenterally and orally with aureomycin. All improved shortly after such therapy was started. In 3 cases the improvement was sufficiently striking to suggest that aureomycin may well have been responsible for the change. In Case 4 it is difficult to attribute the improvement to any therapy other than the parenteral aureomycin.

SHAFFER AND OTHERS (*Ibid.*, p. 173) write: Thirteen cases of chronic liver disease have been treated with oral aureomycin.

The usual course of therapy was 2 gm. a day for 30 days.

In 7 cases improvement resulted which may have been related to aureomycin therapy. Case reports of these 7 patients are presented.

In 6 cases there was little or no evidence of benefit from aureomycin.

Dermal sensitivity, manifested by skin and nail changes, was observed in 5 cases. In 4 of these 5, the lesions appeared after exposure to sunlight, indicating the possibility that under some circumstances aureomycin may be a photosensitizing agent.

The results of this study suggest that aureomycin therapy may be of value in some types of chronic liver disease.

HERPES ZOSTER TREATED WITH CHLORAMPHENICOL

DAWSON AND SIMON (*Southern M. J.*, **42**:696, 1949) write: Four patients with herpes zoster were treated during the acute stage with chloramphenicol. Rapid and complete recovery resulted in each instance. The number of patients treated is small, but the dramatic recovery in each instance indicates a high degree of specificity of the drug in the treatment of the condition.

Two patients with postherpetic neuritis were given chloramphenicol without definite improvement.

ONE-DAY AUREOMYCIN TREATMENT FOR GONORRHOEA

CHEN AND OTHERS (*J.A.M.A.*, **143**:724, 1950) write: A series of 100 unselected patients with gonorrhœa was arbitarily divided into two groups of 50 patients each.

Group A was given aureomycin orally three times daily for two days and group B was given the same daily dose for one day. The results obtained from these two groups were identical. There was one failure in each group. Thus, the percentage of cure was 98 in each group.

Toxic reactions were few and not serious. In several patients, the disease. which had failed to respond to penicillin and other medication yielded to aureomycin treatment.

It is apparent that orally administered aureomycin in the doses employed in this study is at least as effective as one injection of penicillin against gonorrhœal infections.

Evaluation of the effect of aureomycin treatment was based on results of a physical examination given a week after treatment was begun. Duration of the disease varied from one day to two months. However, duration of the disease did not seem to have any influence on the speed of recovery.

Of the entire group of patients, 83 were men and 17 were women. In 10 of these patients, the condition had failed to respond to penicillin, chloramphenical or sulpha drugs.

POTASSIUM IN PROLONGED VOMITING AND DIABETIC ACIDOSIS

NADLER AND OTHERS (*J. Lab. Clin. Med.*, **35**:842, 1950) administered potassium to 49 patients with hypopotassæmia; 25 were undergoing treatment for diabetic acidosis, and 24 had intestinal obstruction associated with prolonged vomiting. Hypopotassæmia was suspected after prolonged vomiting due to intestinal obstruction, and the potassium deficit was further increased in many of these patients who received parenteral fluids in which potassium was omitted. Three of the diabetic patients showed skeletal muscle flaccidity, lowered blood pressure, bounding pulse and a loud systolic precordial murmur. The other patients showed only minor degrees of these manifestations, the most prominent of which were skeletal muscle weakness and/or a decrease in the blood pressure, particularly the diastolic component. The determination of the serum potassium was made by the flame photometer. Although the chemical method is of value in the initial diagnosis of a deficit in this cation, it was not always practical for repeated determinations. Therefore, serial electrocardiograms were taken. Prolongation of the Q-T interval accompanied with widening of the T wave and lowering or inversion of the T waves (CR_6) were used as a crude estimate of the serum potassium concentration. When administered orally, both potassium citrate and potassium chloride were given in amounts ranging from 2 to 18 gm. For intravenous use, 100 to 1,000 c.c. of 1·14 per cent potassium chloride were administered. For administration of this drug by hypodermoclysis, 500 c.c. of a 1·14 per cent solution of potassium chloride were mixed with equal quantities of sodium chloride. The administration of potassium is contraindicated in patients with poorly functioning kidneys, but the authors believe that, if the azotæmia is prerenal and the serum potassium concentration is decreased, cautious administration of potassium may help relieve the shock like state and improve renal function. The serum potassium concentration is the important factor in determining the optimum time to administer potassium and the rate at which this cation may be administered. Potassium should not be administered unless the serum concentration is decreased. In order to avoid cardiotoxic effects, one must not give an amount exceeding the clearance of this cation from the blood into the intracellular space and urine.

ORAL USE OF ORGANIC MERCURIAL DIURETICS

VANDER VEER (*Circulation*, **1**:516, 1950) writes that the oral administration of an organic mercurial compound over prolonged periods of time is a useful, safe and effective method of promoting and maintaining diuresis in ambulatory patients with congestive heart failure. The author used mercuzanthin in 34 patients. Each tablet of mercuzanthin represented the concentrate of 0·74 c.c. mercuzanthin solution (mercurophylline injection, USP), equivalent to 0·030 gm. mercury and 0·027 gm. anhydrous theophylline. The usual initial dose was two tablets thrice daily. Once diuresis was established the maintenance dose had to be established individually for each patient. Two patients did not respond to this treatment. No serious toxic effects were observed.

ANTIDOTES TO CARDIOTOXIC MERCURIALS

CRAVER AND OTHERS (*Am. Heart J.*, **40**:590, 1950) give in the following lines the summary of their observations:

15 mg. per kilogram of the sodium salt of pyridenedicarboxyl-betamercuri-omega-hydroxypropylamide-theophylline injected into the jugular vein in dogs was shown in over 80 per cent

of the cases to cause fatal ventricular fibrillation after the first dose, and in 100 per cent after the second dose.

Magnesium sulphate offered some protection against the cardiac toxicity of the mercurial diuretic studied, but by the method employed herein somewhat larger doses were required than Pines and his associates had found necessary. The degree of protection afforded was not great and in no way comparable to that afforded by thiol derivatives.

Atropine sulphate or vagotomy appeared to offer very weak protection. if any.

BAL seemingly offered complete protection against the cardiac toxicity of the mercurial studied.

Ascorbic acid and acetylcholine in the doses employed did not restore ventricular fibrillation to a normal rhythm, but manual manipulation occasionally, and electrical stimulation usually, did restore a normal rhythm.

Oxygen for Cardiac Infarction or Angina Pectoris

Russek and others (*J.A.M.A.*, **144**:373, 1950) write: High concentrations of oxygen have been advocated for the relief of intractable pain accompanying acute myocardial infarction and severe paroxysms of angina pectoris even in the absence of arterial anoxæmia. In order to determine whether the administration of 100 per cent oxygen is capable of influencing anoxia solely confined to an area of myocardial tissue, the effect of this therapy on the electrocardiographic response to standard exercise (Master two-step test) was studied in 5 patients with angina pectoris. The following observations were made:

1. The administration of 100 per cent oxygen did not prevent the RS-T segment and T wave changes induced by standard exercise and failed to hasten the disappearance of these manifestations of myocardial anoxia. On the contrary, more pronounced and prolonged electrocardiographic alterations were observed in several patients when treated in this manner.

2. The administration of 100 per cent oxygen failed to prevent the onset of anginal pain or to influence its duration.

3. In striking contrast, administration of one tablet of nitroglycerin (glyceryl trinitrate) 1/150 grain (0·4 mg.) not only prevented the development of anginal pain but greatly modified the electrocardiographic response to standard exercise in each case.

From these observations, it is concluded that inhalation of 100 per cent oxygen does not influence myocardial anoxia in patients with acute cardiac infarction or angina pectoris in whom the oxygen saturation of arterial blood is normal. Therefore, benefit should not be anticipated in such cases when this form of therapy is administered for the relief of intractable pain. Some evidence suggests that hyperoxygenated blood may actually interfere with the reactive hyperemia which is evoked by myocardial anoxia. The authors wish to strongly emphasize that oxygen should be freely administered when an indication for its use is recognized or even suspected. Its indiscriminate employment, however, may result in more harm than good in the individual case.

Antihistaminics and the Common Cold

The following is the conclusion from the Report by a Special Committee of the Medical Research Council on clinical trials of antihistaminic drugs in the prevention and treatment of the common cold:

In a small but carefully controlled experiment two antihistaminic drugs—promethazine hydrochloride and chlorocyclizine hydrochloride—showed no evidence of having any value in the prevention of experimentally induced colds.

A large-scale clinical trial of thonzylamine in widely separated areas in Great Britain and Northern Ireland, carried out between the middle of March and the middle of May, 1950, showed that, in the dosage employed. this antihistaminic drug had little if any value in the treatment of the common cold.

Some Aspects of Bronchiectasis

Mackenzie (*Lancet*, **2**:186, 1950) at a meeting of Section of Radiology of the B. M. A. pointed out that there are no reported statistics of the incidence of bronchiectasis in a community and went on to quote figures from the Leicester Isolation Hospital and Chest Unit. These showed an incidence highest in children up to the age of 15—the greater proportion of them being females. The incidence in Leicester school—children was 2·9 per 1000; but communities differ according to social factors, the efficiency of isolation of tuberculous parents from children, and the efficiency of chemotherapeutics and antibiotics. The main aetiological factors are, he thought, either mechanical or infective. Congenital bronchiectasis, though it may occur, is rare and so not important. He quoted Lander and Davidson's work showing that traction forces within a collapsed segment produce dilatation of the bronchi, and Lander's later work suggesting that, in an incomplete bronchial stenosis. the collapse is peripherally situated and the bronchus dilated, but that dilatation may also take place in complete obstruction, from secretory pressure.

Dr. Mackenzie regarded infection as the main aetiological factor and discussed infections producing dilatation of the bronchi under the headings of acute, subacute, and chronic. Acute destruction of lung tissue is seen in Friedlander's pneumonia, non-specific suppurative pneumonitis, and certain virus diseases associated with secondary infection. Subacute destructive changes take place in tuberculosis, when the upper lobes are usually involved, but most cases of bronchiectasis are due to chronic infection and begin with atelectasis of the lower lobes either from an inflammatory cause or from glandular pressure, particularly tuberculous hilar adenitis.

Dr. F. Whitwell said that in reviewing about 200 operation specimens of bronchiectatic lungs he found, broadly speaking, three pathological types:

The *follicular type* is seen in children. usually as a sequel to measles, whooping-cough, or influenza, and is really a chronic interstitial pneumonic type. Microscopically, the bronchi are thickened, the alveoli become solid, and there is a surrounding chronic interestitial pneumonia. Fibrosis develops as a later stage following collapse.

The *saccular type*, in which the dilatation of the bronchi is greater, occurs in older patients and does not seem to be related to previous illness. It arises as a chronic mural bronchitis in which the larger bronchioles become thickened, the smaller lateral bronchioles become obliterated, and the end-result is an elongated sac which may become filled with pus. This infection causes a dilatation and so the saccule is formed.

Atelectatic bronchiectasis occurs as a result of obstruction usually due to hilar adenitis causing blockage of the main bronchus and so collapse of the lung. It is commonest on the right side and may revert to normal if the cause of the

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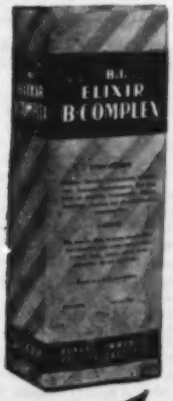

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obstruction is removed. If there is fibrosis, bronchiectatic changes will develop.

Dr. Whitewell found that nasal sinus infection is a common sign in the follicular and saccular types but is rarely seen in the atelectatic bronchiectasis.

Dr. F. J. Prime discussed bronchiectasis from a physiological point of view. It causes, he said, uneven ventilation of the lung resulting in arterial suboxygenation. The carbon dioxide content, however, is not usually raised unless some secondary condition is present, such as severe emphysema. In examinations of bronchiectatic subjects he found that both the vital capacity and the maximum breathing capacity were below normal.

In the discussion which followed, several speakers pointed out that the terms bronchiectasis was loosely used, and all made a plea for a more rigid classification.

Hiatus Hernia

Rossien and others (*Am. J. Digest. Dis.*, **17**:59, 1950) give in the following lines the summary of their observations:

Hiatus gastrica is much more frequently observed in females than males. A relaxed widened diaphragmatic œsophageal hiatus in the middle or older age groups, when associated with increased intraabdominal pressure, is the major etiological factor.

Thirteen cases of hiatus hernia are reported.

Seven out of eight that were hospitalized had bleeding from their gastrointestinal tracts. One of these patients was found to have an ulcer in the herniated portion of the stomach.

Pain beneath the xiphoid process and the epigastric region is the commonest symptom. Belching, heartburn, and vomiting recur frequently. These symptoms usually are not recognized as being due to hiatus gastrica because the patients are in the age group when many other gastrointestinal, biliary tract and cardiac disease entities tend to develop.

The diagnosis is dependent upon confirmation by roentgenologic study. The study must be carried out in the erect, prone, and Trendelenburg positions; wherever this condition is clinically suspected but not roentgenologically demonstrated in one study, a repeat study several weaks later should be undertaken because hiatus hernia may be of the transitory type.

The treatment is usually medical and consists of antispasmodics, sedatives, analgesics, weight reduction, bland diet and treatment of the associated conditions. Surgery when indicated consists of phrenicotomy for a palliative procedure and radical closure for the more severe cases.

Diagnosis of Early Cancer of Colon and Rectum

Granet (*Am. J. Digest. Dis.*, **17**:95, 1950) writes that delay in the diagnosis of early rectal and colon cancer is due to the patient's procrastination in reporting for examination when large bowel disturbances occur. The physician fails to diagnose early lower bowel cancer because of errors of omission, *i.e.*, he fails to take and evaluate an intelligent history and to follow this with a proper examination.

Cardinal symptoms of colon and rectal cancer include: (1) Blood in the stool. (2) Change in the usual pattern of bowel habit. (3) Pain and tenesmus. (4) Constitutional symptoms. Cancer of the rectum and colon is not a geriatric disease. It occurs commonly in the young.

Eighty per cent of recto-colonic cancers can be diagnosed by physical examination. They can be palpated with the examining finger or can be visualized through the proctosigmoidoscope. When symptoms are present and are not accounted for by sigmoidoscopic examination, a diagnostically adequate barium enema examination is mandatory.

Polyps are premalignant lesions and should be removed when found. Purportedly benign chronic anorectal lesions such as fistulas, papillae and fissures are sometimes premalignant and are best excised.

Malignant Tumors of the Lung

McDonald and Woolner (*Minnesota Med.*, **32**:1186, 1949) write that the Mayo Clinic has a laboratory in which cytological examination of the sputum and bronchial secretions is performed routinely in all cases in which the presence of bronchogenic carcinoma is suspected. During the three years that this laboratory has been in operation this method of examination has been employed in approximately 6,000 cases.

In more than 400 of these cases, it has disclosed the presence of carcinoma cells. In approximately four-fifths of the 6,000 cases, the material has consisted of sputum; in the remaining cases, it has consisted of bronchial secretions, bronchial smears or bronchial washings, all of which have been obtained by bronchoscopy.

If the patient is not in the hospital, sputum is collected in a sputum bottle containing 8 to 10 c.c. of 95 per cent alcohol. Under such circumstances, the time that elapses between the collection of the material and the cytological examination is not important. In cases in which the patients are in the hospital, it is possible to receive the sputum in the laboratory within a short time after it has been expectorated. In these cases, fresh sputum is used.

An exploratory operation has been performed in 144 of the 400 cases in which cytological examination of the sputum or bronchial secretions has disclosed carcinoma clels. Pneumonectomy or lobectomy was performed in 77 of the 144 cases. The value of this diagnostic method has been questioned because the presence of carcinoma cells in the sputum or bronchial secretions has been said to be a late manifestation of bronchogenic carcinoma. In this connection, it is interesting to note that the presence of carcinoma cells in the sputum or bronchial secretions was the only microscopic evidence of carcinoma in 32 of the 77 cases in which the lesion proved to be operable.

This method of diagnosis is particularly valuable in cases in which a bronchogenic carcinoma is situated in an upper lobe or involves a small bronchus at the periphery of the lung. The upper lobe is particularly inaccessible to the bronchoscopist. Of the malignant tumours which involve the upper lobe, Pancoast's tumour and those which cause obstruction of the superior vena cava are of particular interest.

The authors conclude that cyotological examination of the sputum and bronchial secretions is very useful in the preoperative diagnosis of bronchogenic carcinoma. It should be remembered that this method of examination results in a falsely negative diagnosis in approximately 30 per cent of cases and that it results in a falsely positive diagnosis in approximately 2 per cent of cases.

Parathyroid Adenoma and Renal Calculi

Kretschmer (*J. Urol.*, **63**:947, 1950, Ref. *J.A.M.A.*, **144**:420, 1950) discusses the relationship between lesions of the parathyroid glands and renal calculi. A woman aged 35 died probably as the result of a hyperparathyroid crisis. She had had a parathyroid adenoma of at least seven years' duration, as evidenced by recurrent episodes of renal calculi. Another patient had parathyroid disease at the time of her first nephrectomy for stone. She subsequently underwent a pyelotomy for removal of a stone. An adenoma of the thyroid was removed at a later date. The third patient had undergone removal of a urinary stone two years earlier. Later, after a cholecystectomy for cholelithiasis, she passed more calculi; some time later renal lithiasis due to parathyroid adenoma was diagnosed. She underwent ureterolithotomy, and several months later a parathyroid adenoma was removed. The fourth patient was a man aged 35 who had undergone right nephrectomy for renal calculi. then a left ureterolithotomy and later pyelotomy for a stone impacted in the ureteropelvic junction. The patient died as the result of a peritonitis due to a perforated ulcer. Necropsy revealed, in addition to multiple duodenal ulcers, adenomas of the parathyroids, adenocarcinoma of insular tissue and multiple adenomas of the adrenal cortices. Kretschmer feels that the urologist should look for parathyroid disease in all cases of renal and ureteral stone, especially in recurrent cases.

Postphlebitic Syndrome: Treatment by Conservative Measures

Ochsner and others (*Surgery*, **27**:161. 1950) say that either because of lack of adequate therapy or because of failure of the patient to respond to the prescribed treatment. a disabling complication, the postphlebitic syndrome, develops in many patients with venous thrombosis. Postphlebitic sequelae consist of persistent edema, pain, varicosities, ulceration. and recurrent streptococcic infections.

During the six-year period ending October, 1948, the authors have treated approximately 600 patients with the postphlebitic syndrome, 246 of whom have been adequately followed for a period of six months or longer; this group forms the basis of this study.

The cause of the original thrombophlebitis in this series varied considerably. Of the 246 cases, 76 (30·9 per cent) occurred postoperatively; 40 (16·3 per cent) post partum; 39 (15·9 per cent) followed a severe infection, such as typhoid fever or pneumonia; 30 (12·2 per cent) occurred spontaneously; 29 (11·8 per cent) were of unknown etiology; 23 (9·3 per cent) were posttraumatic; and 9 (3·7 per cent) began as a thrombophlebitic process in varicose veins. Undoubtedly in many of this last group, the cause was spontaneous.

Persistent postphlebitic œdema is due to one of three causes: (1) persistent vasospasm, (2) increased venous pressure due to incompetence of the valves of the deep veins, or (3) extensive perivenous cicatrix. Relief of the œdema following vasodilatation suggests that vasospasm is the etiologic factor. If no relief is obtained by vasodilatation, phlebographic studies are indicated to determine the presence or absence of incompetence of the valves of the deep veins and perivenous cicatricial contraction.

In the present series of 246 patients, 57 per cent were treated by conservative measures, 43 per cent had sympathectomies, and 21·5 per cent had other radical measures. Sympathectomy was done more frequently in men (41·7 per cent) than in women (38·6 per cent) because disability in a man who is a wage earner is more significant than a similar disability in a woman.

Of the 246 patients, 16·7 per cent became asymptomatic, 34·5 per cent were definitely improved, 42·3 per cent had slight or no change, and 6·5 per cent became worse in spite of therapy. The more chronic cases responded as well as those of shorter duration. Of 92 pateints with symptoms less than two years, 53·2 per cent was improved by therapy, and of the 152 patients with symptoms two years or longer, 50 per cent were improved by therapy.

Although sympathectomy is of value in the treatment of postphlebitic œdema due to persistent vasospasm, more radical procedures are necessary in many cases of postphlebitic sequelae.

Incompetent valves of the deep veins are an indication for deep venous ligation and frequently subfascial ligation of the communicating veins. The latter is particularly indicated in the presence of ulceration.

Recurrent erysipeloid infection can be prevented by controlling the œdema and preventing entrance of streptococci, particularly through the feet by the presence of epidermophytosis. —*U. S. Surg. News Letter.*

Side Effects and Complications of Sympathectomy for Hypertension

Fowler and de Takats (*Arch. Sug.*, **59**:1213, 1949) write that the literature contains reports of several thousand patients who have undergone various forms of sympathetic denervation for the relief of hypertensive vascular disease. A comparison of the various types of operative procedures has been made by the authors elsewhere. The majority of patients have undergone resection of the sympathetic chain from the ninth thoracic through the second lumbar ganglion combined with bilateral resection of the splanchnic nerves.

The authors feel that a study of operative complications is indicated as an aid in evaluating the side effects and the risks of the operation. By this means morbidity and mortality rates can be reduced, and final results will be improved.

Of the physiologic changes that follow sympathectomy the authors discuss postural hypotension, substernal fluttering and breathlessness, hyperhydriosis, accentuation of motor tonus. derangement of sexual functions, motor or sensory dysfunction and elimination of visceral pain.

The section of the splanchnic nerves may be followed by cardiac, cerebral and renal complications.

If there has been proper selection of cases, technical complications will account for most of the morbidity after sympathectomy. Shock should be a rare occurrence in any planned surgical procedure if proper precautions are taken. Pulmonary complications are common and may be the result of certain technical errors. Neuralgia is a familiar complication and may be exceedingly troublesome.

Intercostal neuralgia is most frequent and may be minimized if care is exercised not to damage the nerve while freeing the rib, retracting the intercostal bundle, severing the rib anteriorly or, especially, disarticulating the rib at its costovertebral joint posteriorly. Myalgia of the sacrospinalis or

psoas muscle groups is usually the result of injury produced while attempting to obtain satisfactory exposure of the lumbar sympathetic chain. It has seemed to the author that cutting the former muscle actually has added little to the exposure and has been responsible at times for the presence of post-operative pain and weakness in the back.

Although hæmorrhage from a major vessel was not encountered by the authors, the vessels which they have found to be occasionally troublesome are the intercostal vessels when they are injured near the costovertebral junction high in the chest, the ascending lumbar veins and occasionally small phrenic vessels. The problem is easily resolved by adequate exposure and by well controlled respirations combined with due caution. Generalized oozing from such an immense operative field is rarely a problem. but when present it may be a result of elevation of the blood pressure caused by straining, too rapid administration of fluids or, more often, accumulation of carbon dioxide.

Injury to the thoracic duct in the course of sympathectomy has not occurred in the experience of the authors, though conceivably this duct might be mistaken for the major splanchnic nerve and sectioned if proper identification were not made. Should this occur, it would appear that ligation of the cut ends of the duct would be the wisest course.

Summarizing thier observations the authors say that the undesirable side effects of sympathectomy for hypertension are due to postural hypotension, compensatory accentuation of vasomotor tonus of the non-denervated portions of the body and alterations of sensory and motor innervation of the visceral organs. These may be expected to some degree in all cases.

The selection of cases of hypertension suitable for denervation is still so poorly understood that prediction of operative results in all cases is impossible. The contraindications of surgical treatment of hypertension depend basically on the degree of cerebral, cardiac and renal damage already sustained by the patient as well as on the condition of the peripheral vessels as demonstrated by the lability of the blood pressure to vasomotor tests.

Organic and physiologic changes in the cardiovascular, renal and cerebral systems will result in complications in a definite percentage of patients subjected to sympathectomy for hypertension. Proper selection of cases will diminish the anticipated incidence, though in the experience of the authors this has amounted to 7 per cent. Severe, prolonged and intractable myalgia and neuralgia occurred postoperatively in 13 per cent of their cases despite extreme care and were the major cause of complaint on the part of the patients. Hydrothorax. hæmothorax, pneumothorax and atelectasis were encountered in 23 per cent of their cases but were rarely a problem.

The postoperative morbidity rate of sympathectomy for hypertension was below 10 per cent and the mortality rate below 1 per cent.

Sympathectomy is of benefit in the treatment of hypertension, but the benefits must be weighed carefully against the inherent disadvantages, possible complications and at times uncertain results which will be encountered in any large group of even carefully selected cases.—*U. S. Surg. News Letter.*

Protein Hydrolysate as Routine Supplement to the Postoperative Diet

Wagner (*Am. J. Surg.*, **78**:500, 1949) writes that the purpose of this study was to determine whether it would be worth while routinely to supplement the post-operative diets with protein hydrolysate. It was believed that the ordinary diets administered in the surgical wards might be inadequate in protein and that routine supplementation with protein hydrolysate might produce a significant effect on the serum protein level and post-operative course of patients.

The dietary supplement employed was a product, which by weight is 45 per cent protein hydrolysate consisting of amino acids and polypeptides derived from animal, vegetable and milk sources (liver, beef muscle, wheat, soya, yeast, casein and lactalbumin) and 40 per cent is carbohydrate (dextrose, maltose and sucrose). One tablespoonful (9 Gm.) contains 4 Gm. of protein hydrolysate.

No changes were made in the various diets which the patients ordinarily received post-operatively. Analysis of the regular surgical ward diet over a period of one week revealed a daily average of approximately 270 Gm. of carbohydrate, 80 Gm. of protein and 75 Gm. of fat and approximately 2,075 calories.

There were 70 patients who received supplemental feedings and 70 control patients. The amount of protein hydrolysate administered was three tablespoonfuls four times a day, equivalent to 48 Gm. of protein. This was given orally whenever possible or through an indwelling tube during the early post-operative period.

Comparing the control and supplementally fed group as a whole, the slightly higher serum protein levels and questionably better post-operative course clinically in the latter group are mildly encouraging but not significant.

The difference in serum protein levels in favour of the supplementally fed group following major gastric and colon surgery indicates a real need for protein supplementation but in much greater amounts than was used in this series.

Administration of the protein hydrolysate in the dosage and manner used in this study is not warranted as a routine procedure for all surgical cases. This is not meant to refute the well established indications for protein therapy in prophylaxis or treatment of hypoproteinemic states, but there is no more justification for giving protein hydrolysates routinely than for routine administration of vitamins, antibiotics or blood transfusions.—*U. S. Surg. News Letter.*

Radiotherapy of Cancer in the Mouth

A Medical Research Council team, headed by Dr. Constance Wood and Mr. J. W. Boag, B.SC., and drawn from the council's Radiotherapeutic Research Unit, has been comparing the efficacy of gamma rays and x-rays in the treatment of cancer in the mouth. Their report, now published, was eagerly awaited because of the urgent need to decide whether money would be better spent on the development of radium-beam units in all major centres or on other forms of apparatus. Human therapeutic experiments that will satisfy the statisticians are always difficult to devise and to carry out, but in these trials careful planning, with strict standards of comparison and physical control, ensured complete accuracy within the limits set. The comparison made was between the gamma

beam from 10 grammes of radium and an x-ray beam at 180 kv, so arranged that the isodose curves of the two types of radiation were almost perfectly matched. Beam direction was obtained by using treatment callipers, and tumour dose was calculated with measuring callipers or with the contour-finder devised for the purpose and described in the report.

Statistical analysis, with special methods of estimating survival-rates, has given the following results. The estimated cure-rate at 5 years for patients treated with the radium beam is 41 per cent (the actual survival-rate at 4½ years, which was not known until after the report was written, is 28 per cent), and with x-ray beam 19·2 per cent (actual survival-rate at 4½ years, 20 per cent). The difference between the 5-year rates is 11·8 per cent which is less than 1·62 times its standard error and therefore not significant. The final conclusion reached in the report—"This investigation does not show that the wavelength of the radiation per se, within the limits of the experiment, has any significant effects on the clinical results." —will be generally accepted. But it is not the complete answer to the question whether the radium beam has special advantages as a therapeutic instrument. Before forming an opinion on this question several striking findings in the report should be considered.

The detailed statistical tables show that at least eighteen patients with palpable lymph-glands, seven of whom were treated with the x-ray beam, were symptom-free for 3 years or longer. Cure of malignant glands by radiotherapy is rare enough to make this a considerable achievement, and the report points out that the usual view that secondary cancer in glands is more resistant and responds more slowly to radiation than the primary tumour was not borne out in this series, in which the glands often disappeared first. This suggests a special place for the radium beam, or even for an x-ray beam of this type, in the treatment of casse where cancer in a difficult site, accompanied by palpable lymph-glands, makes block-dissection of the neck almost impossible.

The effect of the two types of radiation on the skin is also important. It was found that the cases treated with x-rays developed skin reactions earlier and more severely; so a further comparison was arranged between symmetrical fields on the two sides of the neck of patients with suitable lesions, the fields on one side being treated with gamma rays and those on the other with x-rays. The experiments show that the average ratio of gamma ray dose to x-ray dose for the same visible skin reaction was 1·34:1. Thus gamma radiation has a definite advantage, even if this is due to differences in penetration and absorption and not to any specific wave-length effect. There is thus some evidence that beam therapy has special uses and that, even if the experimental x-ray beam was a practical instrumnt, beam therapy should be given by means of gamma rays.

In the radium beam we have a source of radiation with which the block of tissue which contains the tumour can be raised to the requirerl dosage, and which, if the tumour is superficial enough, gives a rapid fall in dosage outside this block, thus increasing the toierance of the normal tissues. Analysis of the results of treatment by site indicates the sites in which conditions are favourable for radium-beam treatment. Unfortunately, however, in some sites, particularly the pharynx, this method, in common with all others, results is so tew

(*Concluded at foot of column 2*)

YOUR QUESTIONS

Correspondents should give their names and addresses (not necessarily for publication) and include all relevant details in the questions which should be typed. Questions of medical interest only will be acceptable for this section. They should be sent in a separate envelop marked "Your Questions". Questions of general interest will be published in preference. Lack of space precludes answering all the questions received.

Q. *In a patient of mine, all measures like massage, diathermy, intravenous injection of sodium iodide, autogenous vaccines, ultraviolet rays have failed to sterilise the prostate of pus containing B. pyocyaneus. What else can be done?*

Ans. A thorough urological examination is the first thing that is to be made to find out whether there is any obstruction or not. If obstruction is present, it should be relieved. If, on the other hand, there is only a prostatitis without any associated pathologic change present, prostatic massage is the best local treatment that can be suggested. Aureomycin hydrochloride in suitable doses should be tried, as B. pyocyaneous is sensitive to this drug.

Q. *Please describe the Sanger modification of cesarean section.*

Ans. Sanger introduced his modification of the cesarean operation in 1882. De Lee states that the following were the essentials of the operation:

"Median abdominal incision; median uterine incision, with or without eventration of the uterus; use of rubber ligature around cervix to stop hæmorrhage; resection of a strip of uterine muscle under the peritoneum; eight or ten interrupted silver wire seromuscular sutures, avoiding the decidua; twenty to twenty-five interrupted fine silk seroserous (Lambert) sutures; extreme antisepsis."

It is doubtful whether any one uses it in the original form.

Q. *Is it permissible for one suffering from diabetes mellitus to use saccharin?*

Ans. Yes, it is safe for a diabetic patient to use saccharin, as it will not raise the blood sugar level or cause sugar to appear in the urine.

(*Continued from column 1*)

survivals that no conclusions can be drawn from the figures. For lesions at the back of the mouth and for some laryngeal lesions, more particularly when the lymph-glands are involved, provisions for radium-beam therapy should certainly be made. The report says: "Such apparatus" (the 10 gramme bomb) "may continue to be used in routine treatment for some time to come"; it might have gone further and expressed the belief that some form of beam therapy with either radium or radioactive cobalt, will continue to be used so long as irradiation is chosen for the treatment of oral cancer.—*Lancet*, **2**:179, 1950.

SUPPLEMENT
Journal of the Indian Medical Association

VOL. XX, No. 4 CALCUTTA JANUARY, 1951

ALLAHABAD BRANCH—The following office-bearers were elected at the Annual General Meeting of the Allahabad Medical Association held on 27th April 1950 for the current year:

Patron—Dr. B. K. Mukerji, *President*—Dr. Brijraj Kishore, *Vice-Presidents*—Dr. K. R. Jha and Dr. G. Ghose, *General Secretary*—Dr. S. K. Mukerji, *Joint Secretary*—Dr. D. N. Bhatnagar, *Scientific Secretary*—Capt. R. R. Koty, *Social Secretary*—Dr. Prannath Gupta, *Treasurer*—Dr. K. P. Srivastava, *Librarian*—Dr. Ramesh Chandra. *Members of the Executive Committee*—Drs. S. N. Basu, L. N. Srivastava, M. L. Kakkar, Mrs. S. Majumdar, and Capt. K. C. Bhattacharji. *Representatives to Provincial Council of I.M.A.*—Drs. Brijraj Kishore, S. K. Mukerji and Prannath Gupta.

BERHAMPORE BRANCH—At the annual meeting of the Branch held on 25-2-50 under the Chairmanship of Dr. B. V. Narsimham, followed by a dinner, the following office-bearers were duly elected for the current year:

President—Dr. P. Satyanarayana. *Vice-President*—Capt. S. B. Palit. *Secretary*—Dr. M. V. Ramanayya. *Representative to the Central Council of the I.M.A.*—Drs. M. V. Ramanayya, S. Bhimaraja. *Executive Committee Members of the Berhampore Branch of the I.M.A.*—Drs. P. Rajeswara Rao, J. Ahmad.

COIMBATORE BRANCH—A meeting of the Coimbatore District Medical Association was held at Valparai in the Anamalais on Sunday the 23rd April, 1950 in connection with the inauguration of the Anamalais Medical Association as branch of the Coimbatore Dt. Medical Association.

A party of over 30 members—both resident and non-resident—left Coimbatore by bus and cars at 7-30 A.M. on the morning of Sunday the 23rd April 1950 and reached Valparai at about 11 A.M. All the doctors from the Anamalais numbering 16 were present. The party on arrival was received by the Anamalais doctors and was treated to sumptuous refreshments at the Panchayat Board School. Then the members adjourned to the Panchayat Board Hall for the Clinical Meeting.

The President of the Association, Major N. Krishnaswami, took the chair. The Secretary, Dr. A. G. Leelakrishnan, presented the minutes of the Silver Jubilee Session of the Association and of the Committee meeting held on 13th April, 1950, which were unanimously approved.

Then Dr. S. Dorairaj of Hardypet in requesting the President, Major N. Krishnaswami to formally inaugurate the Anamalais Medical Association mentioned that all the medical officers in the area joined the association. Maj. N. Krishnaswami, the president, expressed his pleasure in inaugurating the 1st branch of the Coimbatore Dt. Medical Association at Valparai and hoped that other places where there were groups of medical men might form branches of the District Medical Association which would be of mutual advantage to both the branch and the parent body. He praised the efforts of Drs. Dorairaj and Jayachandran in the formation of this new Association.

Dr. S. Dorairaj then announced that at a preliminary meeting of the doctors of Anamalais held on 15th April, 1950, the following office-bearers for the local Association were elected.

President—Dr. S. Dorairaj, B.A., L.M.S., Hardypet.

Jt. Secretaries—Drs. Dr. M. K. R. Jayachandran, M.B.B.S. Valparai, V. Krishnamurthy, M.B.B.S., Sholapur.

It was also decided then that social and/or clinical or professional meetings of the local association shall be held every month on the second Sunday afternoon each month at a central place or in the estate of the Doctor who will be the host for the meeting.

A. G. Leelakrishnan, the Secretary of the District Medical Association, then announced that for the sake of convenience, the local association may collect a subscription of Rupees Twelve a year from the members from the Anamalais, out of which amount, Rs. 10/- per member per year to be remitted to the Dt. Medical Association. Thus the local association will have Rs. 2/- per member per year for its expenses.

The president. Major N. Krishnaswami, then requested Dr. S. Dorairaj, president of the Anamalais Medical Association, to address the members on the first of his promised series of lectures on 'Plantation Nutrition—Phyrnoderma—Is it a Vitamin B Complex Deficiency or a Vitamin A Deficiency?" Dr. Dorairaj at the outset mentioned about the original work done by him on this question on labourers in a group of tea plantations for over a period of 14 consecutive years. He mentioned about the beneficient effects of food rationing on this condition and gave reasons for conclusion that this condition—Phyrnoderma is due to the absence of a factor associated with Vitamin B complex.

A lengthy discussion followed in which Drs. R. Sundararaan, D. Sundareswaran, V. Kalyanasundaram, P. K. Kalyanaraman and others took part.

Then the president requested Dr. M. P. Pai to address the members on "Acute Abdomen". Dr. Pai dealt briefly with acute abdominal emergencies,—both inflammatory and obstructive types, on the diagnosis of the inflammatory and obstructive types of appendicitis and of acute duodenal ulcers In the discussion that followed the following members among others

took part—Drs. C. R. Thiruvengadam, P. A. Narayanan, P. K. Kalyanaraman, A. G. Leelakrishnan and S. Dorairaj.

Dr. M. K. R. Jayachandran then presented reports of a few of his interesting cases.

Then Dr. A. G. Leelakrishnan, the Hony. Secretary, proposed a vote of thanks to the President and members of the Anamalais Medical Association for their hospitality and for the excellent arrangements they had made for their reception and wished the local association an unfettered career of useful service. He also thanked Dr. S. Dorairaj and Dr. M. P. Pai, for their interesting clinical contributions and to the other members who responded to the invitation in spite of personal inconveniences and professional engagements.

The members were then treated to a sumptuous lunch at Panchayat Board School which was very much appreciated by everybody especially after a lengthy clinical meeting of over three hours' duration.

The guests were then taken round to the Stanmore Group Hospital. Dr. M. K. R. Jayachandan, the Medical officer of the Hospital, took the visitors round the wards.

* * * *

The Monthly clinical meeting of the Association was held at 6 P.M. on Saturday, the 17th June 1950 in the Association premises. Eightyfive members were present. Major N. Krishnaswamy, the President presided.

Major N. Krishnaswamy welcomed Lieut.-Col. C. K. Prasadda Rao, Physician, General Hospital, Madras and Dr. T. S. Thirumurthy, a former President of the Provincial Medical Association and requested the former to deliver his address on "Cirrhosis Liver".

The learned lecturer dealt at length with the pathology of liver cirrhosis and the treatment of the condition in great detail. At the request of the members Dr. Thirumurthy also addressed the members. A discussion followed in which several members took part.

DOOARS BRANCH—Proceedings of the Extra-ordinary General Meeting of the Dooars Branch of I.M.A. held on 4th June 1950 at 3 P.M. at Banarhat H. E. School with Dr. N. G. Majumder in the chair.

The following Office-bearers were elected for the year 1949-50.

President—Dr. G. N. De, M.B. Debpara Tea Estate, P.O. Banarhat. *Vice-Presidents*—Drs. N. G. Majumder, M.B. P.O. Atibari (Dooars), R. G. Roy, Dalmore T.E. P.O. Birpara. *Hony. Secretary*—Dr. S. K. Kundu, Katalguri T.E. P.O. Banarhat. *Hony. Asst. Secretary & Treasurer*—Dr. K. C. Banerjee, Debpara T.E. P.O. Banarhat

EAST GODAVARI BRANCH—Minutes of the Monthly Clinical Meeting of the East Godavari Branch of the Indian Medical Association, Kakinada, held at Ramachandrapuram on 22-4-50 under the Presidentship of Dr. C. Sitaramaraju, M.B.B.S.

After Tea, and an appeal for the Memorial Funds of Dr. P. Gurumurty and Dr. Y. Subbarao, the Chemists and Druggists of Ramachandrapuram Taluk came forward with a Purse of Rs 116/- (Rupees one hundred and sixteen) for the Memorial Fund of Dr. Y. Subbarao. It was accepted with thanks by the Association. A proposal for collecting Funds for the East Bengal Relief under the auspices of our Association was put forward but as the purse for the memory of Doctors Gurumurty and Subbarao had not come to an adequate sum, the proposal was dropped for the time

The President impressed on the members about the importance of attending meetings and taking part in the discussions of the subjects and how it facilitated revision of subjects to be up-to-date.

Due to the unavoidable absence of Captain T. Kanakaraju, F.R.C.S. (EDIN.), Dr. B. Sankararao, L.M.P. read his paper on Surgical Manifestations of Filariasis. Dr. T. Chalapathirao, L.M.P. read a paper on Sex in Primitive Tribes. He touched on many points not taught in the medical curriculum. He impressed that every human being, youths and students, must be taught about sex to avoid innocent crimes and misunderstandings.

After the Clinical Meeting, the members were entertained with many up-to-date musical melodies of Mr. Prayag of the All-India Radio.

With a sumptuous dinner and a vote of thanks by the Secretary, the function came to an end.

* * * * *

Minutes of the Clinical Meeting of the East Godavari Branch of the I.M.A. held at the Visrantipuram Tuberculosis Sanatorium on Saturday the 22nd July, 1950.

A Clinical Meeting of our Association for July '50 was held at the Visrantipuram Tuberculosis Sanatorium, Rajahmundry on Saturday the 22nd July '50 under the Presidentship of Dr. C. Sitaramaraju, D.M.O.

Owing to bad weather, more members could not be present. The few members that attended the meeting were taken to visit the various wards of the Sanatorium by the Medical Superintendent of the Sanatorium. After tea, an appeal was made by the President to the members who have not yet subscribed, to subscribe liberally for the Memorial Fund of Doctors Gurumurty and Subbarao. Afterwards the following condolence resolution was passed on the death of Dr. P. Udayachalarao.

"The President and Members of this Association put on record their heart-felt sorrow at the demise of Doctor P. Udayachalarao and resolve that this be communicated to the members of the bereaved family".

Dr. P. K. Joshy gave an interesting lecture on the Control of Tuberculosis in India and use and abuse of Streptomycin and PAS in the check of the disease. Dr. Pinaka-Pani and Col. D. S. Raju took part in the discussion of the advantages of the two drugs. Captain T. Kanakaraju, demonstrated some cases of Glands Neck operated by him successfully and explained clearly how to tackle such cases.

* * * *

Minutes of the East Godavari Branch of the Indian Medical Association held at the Government Headquarters Hospital, Kakinada on 19-8-1950.

A meeting of our Association for August, 1950 was held at the Government Head Quarters Hospital, Kakinada on

the 19th August, 1950 under the Presidentship of Dr. C. Sitaramaraju.

After Tea an appeal was made to the members who have not yet subscribed to the Memorial Fund of Doctors Gurumurty and Y. Subbarao to subscribe liberally for the above fund.

The members were also requested to pay off their arrears subscriptions as the year was drawing to a close and as large arrears had accumulated.

Afterwards the Clinical meeting began with the Lecture of Dr. B. Venkataraju on the "Essential Principles of Wound Healing". He stressed on many important points about the aseptic surgery and Dr. Kanakaraju, corroborating the ideas and principles stressed by Dr. Venkataraju impressed the importance of diet and rest in wound healing.

HOOGHLY - CHINSURA - CHANDERNAGORE BRANCH—Proceedings of the special general meeting of the Hooghly-Chinsurah-Chandernagore Branch of the Indian Medical Association held on the 29th May 1950 at 7 P.M. at the residence of Dr. Ashutosh Das, Boro, Chandernagore to condole the death of Capt. Ramanath Sinha, M.B., a founder member of the association (died on the 21st May, 1950).

9 Members were present.

Dr. A. Das, President of the association took the chair.

The following resolution was moved from the chair and carried unanimously, all standing in silence for two minutes.

"The members of the Hooghly-Chinsurah-Chandernagore Branch of the Indian Medical Association place on record their deep sense of sorrow and irreparable loss at the sudden demise of Capt. Ramanath Sinha a founder member, a great patron and a president of this association and convey their deep and heartfelt sympathy and condolence to the family of the deceased in their great bereavement."

Resolved further that the Secretary be requested to forward the copy of the resolution to the bereaved family.

KATIHAR BRANCH—Proceedings of an emergent meeting of the Katihar Branch under Bihar Provincial Branch held on 29-3-50:

13 members attended the meeting and the following resolutions were passed unanimously under the Presidentship of Dr. B. N. Chatterjee:

1. It is resolved unanimously that members of I.M.A., Katihar Branch will attend the refugee camp in 3 shifts daily, one hour in the morning (8 A.M. to 9 A.M.) and 2 shifts in the evening (5 P.M. to 9 P.M.)

2. It is further resolved that a Sub-Committee be formed to contact with Refugee Committee and work out the detail of work.

3. Resolved that a copy of this resolution be forwarded to the District Magistrate, Purnea, and the Secretary Refugee Camp, Katihar, and Provincial Secretary, I.M.A., Patna, for information

KHAMGAON BRANCH—The Branch was newly started from 1st April, 1950. The first General meeting was held on the 9th April, 1950 with Dr. Saoji in the Chair.

A new Managing Committee, an auditor, and representatives on the Central and Provincial Councils of the I.M.A. were elected.

A new constitution for the branch was approved.

There are 16 members on the roll at present.

NAGAPATAM BRANCH—The monthly meeting was held on 29-4-50 Saturday under the Presidentship of Dr. C. H. Venkateswaran. M.B.B.S., Civil Surgeon, Nagapattinam. Eleven members were present. Dr. V. D. Rajan, spoke on Diarrhœa.

The following resolution was passed unanimously:

This association recommends that Tanjore District may be bifurcated into two for the purpose of medical administration, with Headquarters at Tanjore and Nagapatam and requests the authorities to take the following facts into consideration in this request.

1. Nagapattinam is an important surgical centre and this hospital should be expanded and made into a District Hd. Qrs. Hospital with all special departments.

2. Nagapattinam is nearer than Tanjore for the Taluks of Nannilam, Tiruthuraipoondi, Mayavaram and Shiyalt.

3. This bifurcation could be put into effect with very little additional expenditure and would provide better medical administration and facilities for the district as a whole.

4. Resolved that copies if the above resolution be sent to the Hon'ble Minister for Public Health, Madras, and the Surgeon-General with the Government of Madras for favour of very early consideration.

After a vote of thanks to the lecturer and the host of the evening, Dr. D. Narayanan, the meeting came to an end.

PORBANDAR BRANCH—Proceedings of the meeting held at 6 p.m. on the 27th April, 1950 in the Bhavsinhji Hospital, Porbandar.

Dr. H. H. Chavda, M.S. (BOM.), President of the Branch, was in the chair

The following business was transacted.

The minutes of the last meeting held on 27-3-1950 were confirmed.

The Hon. Secretary announced that after the last meeting held a month back, 9 new members have been enrolled thus the number of members increased from 12 to 21 *i.e.* 75% increase in members in a month.

The following resolution was passed:

This meeting of the Porbandar Branch of the Indian Medical Association congratulates Dr. B. D. Jhala for having been elected Chairman of the Porbandar Municipality and assures him of full support and whole-hearted co-operation of the Branch in the onerous duties he has been called upon to perform. It also congratulates the Porbandar Municipality for its wise and unanimous selection of Dr. Jhala. It authorises the Secretary of the Branch to forward a copy of this resolution to Dr. Jhala and to the President of the Porbandar Municipality.

Dr. K. W. Waghela, Assistant Medical Officer, Bhavsinhji Hospital, Porbandar, then spoke on Leprosy in India.

Dr. R. N. Maru, Assistant Medical Officer, Bhavsinhji Hospital, Porbandar, spoke about his observations on Hydrophobia.

Dr. Miss K. Nadkarni, House Surgeon, M. R. Hospital, Porbandar, read a case report of Ruptured Uterus.

The President then showed photos and specimens of a case of Mixed Parotid Tumour in a female patient aged about 50 years, of 7 years duration and nephrectomy performed for removal of renal calculus which he had successfully operated.

The President requested the private medical practitioner members to read papers and interesting case reports.

The meeting terminated with a vote of thanks to the chair.

Dr. H. H. Chavda the President of the Branch was "At Home" to the members of the Branch.

TANJORE BRANCH—The 14th Annual Conference of the Association was held at 10 a.m. on Saturday the 15th April, 1950 in the Medical School Buildings, R. M. Hospital, Tanjore. About 150 doctors attended the meeting. After prayer, Dr. Mohamed Ismail, President, of the Association, welcomed the Surgeon-General and requested him to preside over the day's proceedings.

The Secretary of the Association read the annual report and the messages received.

Dr. J. C. David, M.B., PH.D. Surgeon-General with the Government of Madras, then delivered his presidential address. He remarked that at a time when every commodity was rationed there was no rationing of speeches. He wished that there was less speech and more deed. He appealed to the doctors to realise the changed conditions of the country and do their best for improvement of medical aid to the people. It was not possible to expect help from the Government always, said the Surgeon-General and added that like the missionaries in the West, workers should be enlisted to carry out medical relief and research work.

After his presidential address he declared open the annual conference. The minutes of the last meeting and the annual report were adopted.

Lt.-Col. V. R. Thayamanaswami of the General Hospital, Madras, was asked to address the Conference on "Fractures about the Shoulder Joint".

A detailed lecture followed by X-ray demonstration and clinical photographs of various types of fractures treated was given. A small discussion followed to which the lecturer gave a suitable reply.

The members then adjourned for lunch given by Ganapathy and Co., Madras, agents Unichem Laboratories.

At 2 P.M. the business meeting commenced, with Dr. Mohamed Ismail in the chair. Certain changes in the draft bye-laws of the Association in the face of its present nature and working conditions were brought before the general body for consideration and were accepted.

1. The Association shall be called the Tanjore District Medical Association (Branch of the Indian Medical Association).

2. The rate of subscription shall be Rs. 14/- per annum and shall be strictly payable in advance.

3. The representatives to Indian Medical Association and collaborator of the Journal of the Indian Medical Association, shall be elected at the annual general body meeting held at the beginning of the year.

The following office-bearers were elected unanimously for the current year:—

President—Dr. Mohamad Ismail, M.B.B.S., D.T.M. *Vice-President*—Dr. T. M. Pillai, L.M.P., Tiruvadi. *Hony Secretary & Treasurer*—N. R. Subramanyam, M.B.B.S., Tanjore. *Committee Members*—Dr. K. Rama, L.M.P., Tanjore; Dr. P. Narayana Rao, L.M. & S., Tanjore; Dr. A. R. L. Swami, L.M.P., Gandarvakottai (Tanjore Dt.); Dr. S. Subbulakshmi, M.B.B.S., D.G.O., R. M. Hospital, Tanjore; Dr. S. Visvanathan, L,M,P., Koradacheri; and Dr. R. Narasimhachari. M.B.B.S., Kumbakonam.

Representatives to the Central Council—Dr. P. A. K. Nair and Dr. N. R. Subramaniam.

Representatives to the Provincial Council, I.M.A.—Dr. R. Narasimhachari, M.B.B.S., Kumbakonam; Dr. M. V. Thyagarajan, M.B.B.S., Kumbakonam; Dr. N. Ramanathan, M.B.B.S., Tanjore.

Collaborator, Journal of the I.M.A.—Capt. G. S. K. Iyer, Tiruvadamarudur.

The afternoon session commenced at 2-30 P.M. with Dr. Mohamed Ismail in the chair.

Dr. A. Srinivasan, M.R.C.P., Hony. Physician, General Hospital. Madras, then gave a very interesting and exhaustive lecture on "Typhoid fever". The value of Diazo reaction and indican in urine in the detection of cases in places where laboratory diagnosis not within easy reach was stressed. The value and the use of Chloromycetin and aureomycin in the treatment of typhoid fever were detailed.

The members then adjourned for tea at 4 P.M. by courtesy of South Indian Manufacturing Co., Madhurai.

After tea, there was an interesting lecture with lantern slide demonstration on Indications for Pulmonary Resection by Dr. Reeve H. Betts, M.B., Department of Thoracic Surgery, Christian Medical College, Vellore. The various indications for pulmonary resection. the conditions before and after treatment were explained along with simultaneous demonstration of slides. The possibility and cure of various conditions of the lung hitherto though incurable were found to be successfully tackled by adequate thoracic surgery. A patient, a young boy, operated and doing well after operation for lung abscess was presented.

A vote of thanks was proposed by the Secretary to the Surgeon-General, lecturer of the day, guests from the neighbouring districts and to manufacturing firms for the lunch and tea given.

The members reassembled to attend a film show—Coramine, Nupercaine Technique by courtesy of Ciba Pharma Ltd. —which was much appreciated by the audience. On behalf of the Association a vote of thanks was proposed to the Ciba Pharma Ltd., for the films shown.

After singing of the National Anthem the day's proceedings came to a close.

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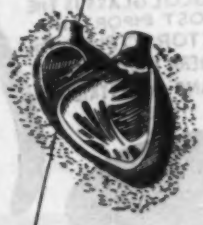

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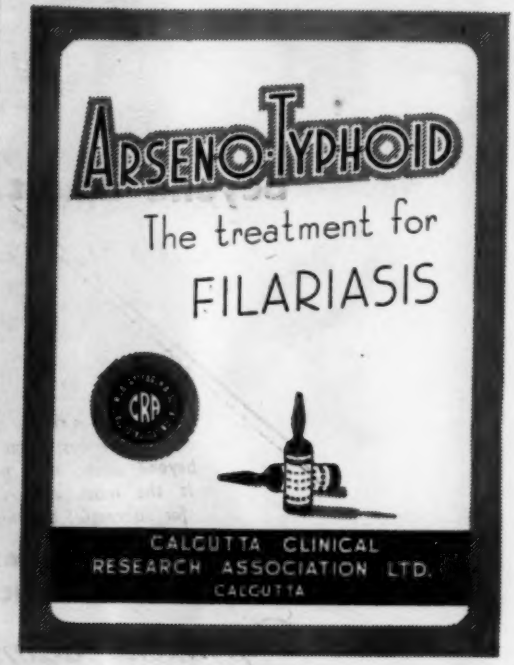

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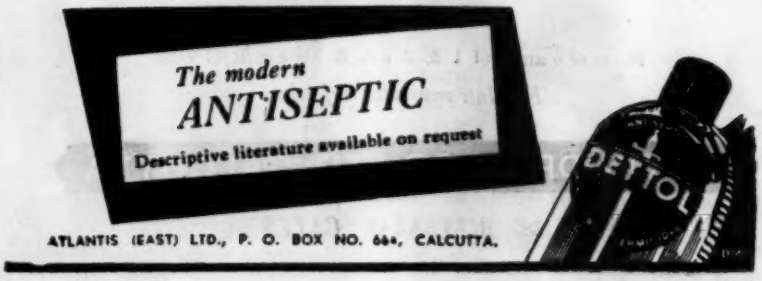

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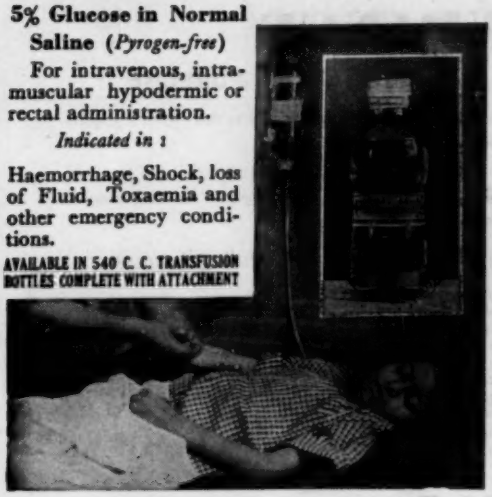

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